

THE AMERICAN School Board Journal

Founded March, 1891, by WILLIAM GEORGE BRUCE

Volume LXVI, Number 1

JANUARY, 1923

Subscription, \$3.00 the Year



APPROACH AND FRONT VIEW, SKOKIE SCHOOL, WINNETKA, ILL.

How the Skokie School was Built

C. W. Washburne, Superintendent of Schools, Winnetka, Ill.

The Skokie School, a \$350,000 upper grade building, built entirely by popular subscription and donated to the Winnetka, Illinois, board of education, has just been publicly dedicated. The story of the financing of this building is unique in the history of American public school education. The building itself represents the best construction known to modern school architecture.

Winnetka, Illinois, is a rapidly growing suburb of Chicago, with a population of about 8,000 and property almost wholly residential. The Winnetka board of education has consistently placed the welfare of its schools before all other considerations. While it has stood for efficient administration, it has never considered a penurious policy in regard to the actual welfare of its children in school as efficient. Consequently, like many other boards of education, it went considerably into debt during the war period and the years immediately following the signing of the armistice.

Furthermore, the low assessed valuation in Winnetka, the lack of business and industrial properties, the legislative limits on bond issues, and the rapid growth of the community, combined to make an adequate building program

a financial impossibility. Meanwhile the number of children in school rapidly increased. Classrooms had to go on to split sessions, the basement of the public library and a parish house were brought into service as schoolrooms; basement rooms, attic rooms, and assembly halls in the existing buildings were drawn into service, and resort was had to every other makeshift known to boards of education with inadequate building facilities.

After much consideration, with advice from outside educators, it was determined that the policy of the Winnetka schools should be to concentrate the upper grades of the three existing schools in one new upper-grade school of the junior-high-school type. A study of population increases showed that a building adequate for even a relatively short time would cost an amount of money far exceeding the maximum bonding power left to the board of education. To pay for such a building out of current funds was equally impossible. Yet the crowding of the schools was becoming intolerable and some way had to be found out of the difficulty.

Various representative citizens of Winnetka were called into consultation by the board of education and asked for their advice and help.

Finally a dinner was arranged to which were invited some twenty prominent business men whose residences were in Winnetka, and the situation was placed before them with stereopticon slides and charts. They were made to see the hopelessness of the board of education's position and the need for a large sum of money to build a new school. After discussing various means of raising this money only one was found which offered any hope of a solution.

The plan finally adopted was a village-wide canvass for subscriptions to the new building. These subscriptions were to be out-and-out donations with no interest or repayment. The business men at this dinner promised to do their share in subscribing to the new school and in lending the campaign their hearty support.

A working committee was then organized from among the citizens of Winnetka, an active publicity campaign was undertaken, the village was districted and each district put under a captain. A careful study of liberty bond subscriptions, war work drive subscriptions, and taxes was used in assigning quotas to the various districts. Plans for the new building were prepared by Perkins, Fellows & Hamilton of Chicago, and pictures were widely circulated.



ASSEMBLY HALL WITH FOLDING DOORS INTO GYMNASIUM OPEN. A CYCLOPAMA SHUTS OFF THE GYMNASIUM AND MAKES THE STAGE BACKGROUND WHEN PERFORMANCES ARE GIVEN. SKOKIE SCHOOL, WINNETKA, ILL.

Window cards and buttons were given to all subscribers, and enthusiasm was engendered through mass meetings.

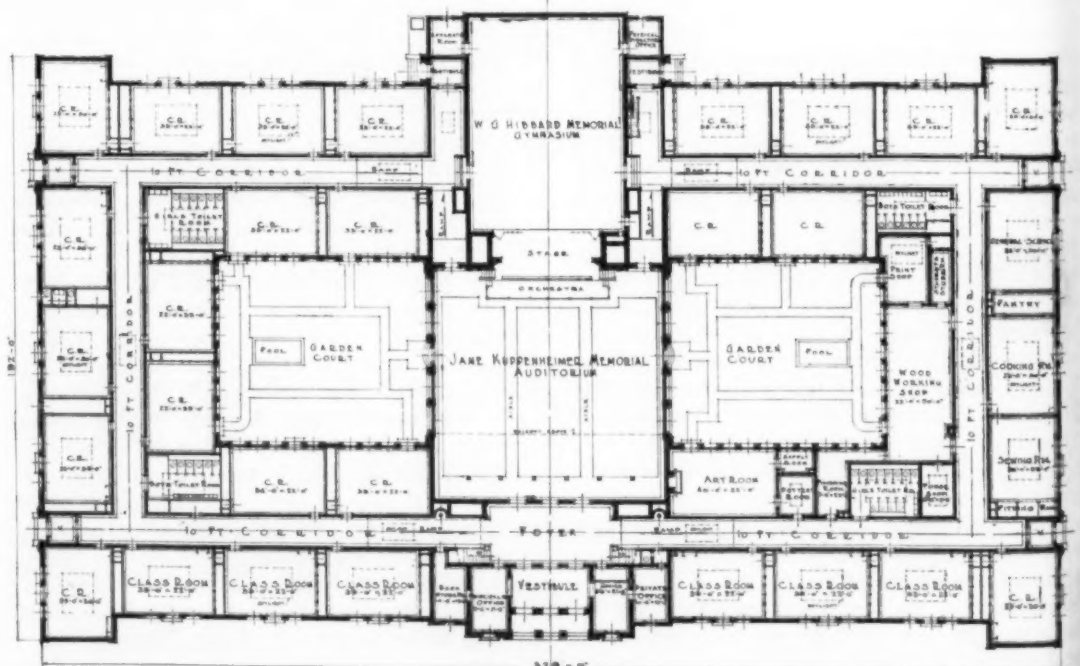
Just as the campaign got well under way and about \$100,000 had been subscribed, a vigorous opposition developed in the section of Winnetka which is furthest from the site chosen by the board of education for the new school. This opposition maintained that the people of the village had never had an opportunity to express their voice as to where the building should be placed, and that, given such an opportunity, the village would be overwhelmingly against the site chosen by the school board on the edge of the town. While it was true that the site had been purchased two years before on a referendum vote as required by law in Illinois, the opposition claimed that this was not the same as a referendum on whether a school should be built on the site. The opposition became so active that a continuation of the campaign for funds was jeopardized, and the board of education finally decided to accept the challenge of the opposition and submit the question of building on this site to a referendum vote before completing the campaign for funds.

All energies then had to be turned to convincing the people of Winnetka that a centralized upper grade school of the junior-high-school type located on the edge of the village where there would be ample playground space, was more desirable than would be additions to the existing schools, making each of them an eight-grade building, or than a centralized upper grade in the middle of the village where adequate playground space would be impossible. Again there were mass meetings, many hundreds of dollars were spent on publicity, a representative of the American Playground Association and Dr. Judd of the University of Chicago School of Education were called in to add their voices to those of the board of education

in urging the type of school planned. The judgment of educational experts from all parts of the country was collected by questionnaires and shown to the people to convince them that the school board plan was the best, and every other possible means was taken to educate the village as to the need both for the junior-high-school type of school organization and for adequate space around the school.

Unfortunately the site chosen by the board of education had long been considered a swamp, the ground just west of it was frequently flooded for a week or two during the spring, and the

site was two miles from the more remote parts of the village. These facts, together with many unfounded suspicions and fears, such as always appear during a heated campaign, gave great strength to the opposition. Every bit of energy and enthusiasm possessed by the board of education and its supporters was used in the contest. When the date for the referendum arrived, automobiles with streamers advocating each side of the question appeared in all the streets, and sample ballots telling the voters how to vote (both ways) were distributed by the thousands. Nearly every adult of voting



FLOOR PLAN

FLOOR PLAN, SKOKIE SCHOOL, WINNETKA, ILL.
Perkins, Fellows & Hamilton, Architects, Chicago, Ill.



NORTH WING, SKOKIE SCHOOL, WINNETKA, ILL. Perkins, Fellows & Hamilton, Archts., Chicago, Ill.

age in the village appeared at the polls. The number of votes polled was far larger than at a presidential election and the returns were watched with more heat and intensity. When the votes were counted the board of education won by a margin of 144 out of a total vote cast of 2,575.

No one had any strength or enthusiasm left for the campaign to raise funds, and the splitting of the village into two hostile camps by the referendum made the solicitation doubly difficult. After waiting about a month, however, the board again launched its campaign, but before it was well under way, summer vacation set in and the campaign again had to stop.

The third lap of the campaign began the next fall, and after a long struggle the \$300,000 mark was reached. Two very large subscriptions had been made contingent upon the total reaching this amount. As soon as this figure was reached, Perkins, Fellows & Hamilton prepared detailed drawings and specifications, contracts were let and the building began.

A supplementary campaign was put on later and brought in \$29,000 more, making the total large enough to pay for the cost of the building itself complete, but not large enough to take care of the work on the grounds. The board still hopes to raise by subscription enough to pay for the outside work, but in any event the remainder of the bills can be taken care of either through bonds or current income.

In the final analysis of subscriptions it was found that over a thousand families had subscribed to the new school, representing about three-fifths of the families of Winnetka. Subscriptions ranged from \$1 to \$5,000 and \$10,000. There was one subscription for \$15,000, and there were two very large donations.

One of these was for \$60,000 to erect the assembly hall in the new building as a memorial to Jane Kuppenheimer, who had been a pupil in the Winnetka schools and had recently died. Her father, L. B. Kuppenheimer, the clothing manufacturer, is a resident of Winnetka. He and Mrs. Kuppenheimer were appealed to on the basis that a public spirited gift of this sort would be a living memorial to their little daughter in a way that nothing else could be. They

were further actuated by the hope that their gifts would inspire other communities to be equally helpful to their schools.

In a similar way the family of William G. Hibbard combined to donate \$40,000 for the erection of the gymnasium of the school in his memory.

The building is now complete. The children are being taken to it from the more remote parts of the village in Wayne school cars mounted on Ford trucks. The president of the organization which formerly opposed the building has been elected a member of the board of education, and the old wounds from the battle are apparently healed. The building itself stands as a monument to the public spirit and interest in education of the people of Winnetka.

The building is in the colonial style, set in a grove of oak trees on a twelve-acre plot of ground. The accompanying pictures show its general appearance.

One approaches it by a semi-circular driveway. On entering the front one passes between high fluted pillars into a vestibule of pressed Dutch half bricks. Opening off this vestibule on the right are the superintendent's offices and on the left the principal's office and a mimeograph room. Going forward one passes through glass doors into a spacious loggia with tiled floor, flanked by two corridors. The corridor on the left stops shortly at a window, but will ultimately extend into the south wing, duplicating the present north wing in general arrangement. The corridor at the right passes around three sides of a hollow square, with classrooms and shops on each side of the corridor. The fourth side of the hollow square is the assembly hall, directly in front of the loggia as one passes in through the front part of the building. The inside of the hollow square is a garden court containing shrubs, flowers, and a cement pool.

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HIBBARD MEMORIAL GYMNASIUM. SKOKIE SCHOOL, WINNETKA, ILL.

Some Phases of the Planning and Installation of School Heating and Ventilating Equipment

Samuel R. Lewis, Heating and Ventilating Engineer, Chicago.

It has been observed that schoolmen have been very much puzzled, in selecting heating and ventilating apparatus, by the conflicting claims of the various more or less revolutionary "systems" which have been advocated by manufacturers.

We advance in civilization very slowly, almost entirely by cut-and-dry methods. Improvements in the tools and usages of civilization come from our attempts to make more satisfactory some device or process which we have found to be unsatisfactory or troublesome in operation.

Some of us are gifted with peculiar ability to notice and to point out such items as are open to criticism. Often these conscientious ones remonstrate about openings (to criticize) which are not so. Others, having been shown the opening, have the faculty of devising improvements. Often the improvements are not truly improvements. Governing and limiting the supposed improvements are a lot of natural conditions and processes which we know a little about, but which we by no means know all about, but which are so.

Schoolmen are optimists. They believe that civilization is bound to advance. They believe quite a lot of what may or may not be so, as told by the fellows who criticize. They believe still more, being constructionists, of what the devisers of improvements tell them. In a word, schoolmen are easy. God bless 'em!

A man who has spent his good money for a thing will believe in and fight for that thing, unless it shrieks to Heaven of failure. Thus almost anyone can get a schoolman to issue a favorable testimonial about almost anything.

A physician follows the school in which he was matriculated. One thinks, with bated breath, of what might be accomplished by an unprejudiced big-pill-little-pill-scientific-chiro-osteo. Yet schoolmen are approached almost exclusively by enthusiasts who have some particular proprietary system to exploit and who oppose bitterly all others.

I have been asked to repeat the story of some of the fundamental ventilation and heating requirements. I haven't any proprietary thing to sell except service. I am a sort of big-pill-little-pill-scientific-chiro-osteo. Being human and a male, I am of course prejudiced, but now that the required preamble is over and I may write of the technicalities which are more entertaining to me, I shall try to conceal the prejudice.

Ventilation Must Be Adapted to Building.

The size of the building, the conditions under which caretaker's services will be rendered, and many local influences must of course have a bearing on the type of plant to be selected for heating and ventilating a school building.

The building ought to be ventilated as well as we know how to do it, and the operation of the ventilating apparatus ought to be enforced. Wherever consistent inspection is carried out, we hear a great deal of complaint to the effect that only those parts of schoolhouse equipment which are essential are used. Thus, where the heating and ventilating are separate, the tendency is to let the ventilating apparatus stand idle, since by so doing fuel and labor are saved. When air washers are provided the tendency is to neglect them, since the usual occupants of the building would not feel particularly any difference, one way or the other. When unit heaters

are used, the tendency is to recirculate the air, since the results are quicker and the dust is much reduced, and the psychological effect of hearing the apparatus operate is the same.

A very great difference in efficiency of ventilating systems may be observed, due to the methods used for causing the fresh air to rub over the bodies of the occupants.

Simply to inject into an apartment an agreed volume of conditioned air does not constitute ventilation. The location and amount of heating and cooling surfaces in the apartment affect profoundly the efficiency of the ventilation. Where there are no heating or cooling agencies and the entering air may be at the same temperature as the air in the apartment, ventilation is easy. Every window, cool wall, hot radiator or warm body sets up a disturbance which tends to interfere with the desired steady and uniform movement of the air from the inlet to the outlet.

Ventilation by Dilution.

It becomes necessary in conventional practice, therefore, to ventilate by dilution, an insufficient method, rather than by displacement, an efficient method. By dilution we try to wash the red ink out of a bucket of water by turning more water in through a hose. By displacement we throw away the whole bucketful and refill with clean water. By dilution it has come to be agreed that the furnishing of 25 to 30 cubic feet per minute of fresh air per person will suffice to remove objectionable odors and to control the temperature without serious drafts. If the air lying next the skin could be wiped away and disposed of as a summer breeze disposes of it, and the exhaled air could be carried along too, a small fraction of 30 cubic feet per minute would suffice. We are learning that ventilation is better when we can dispose the inlets and outlets so as to whirl 'round and 'round the entire room air content either around a vertical axis, as may be done with rather high inlet speeds, with adjustable diffuser blades; or around a horizontal axis, as may be done with inlets at the window sills delivering upward or at an upward angle.

We do not know what, if any, specific poison there is in air contaminated by human contact, but we know assuredly that humans do not thrive unless they are kept pretty consistently in air which has breezy motion, which isn't too hot, which doesn't stay too dry or too moist all the time, and which has pleasing odors or no odors.

Carbonic acid gas, as we find it in air, is not a poison. It is, however, about the easiest measured index we have of air which has been breathed, and its use for this purpose by an observer need by no means brand him as behind the times. There is excellent evidence that the proportion of carbonic acid gas in air is the factor which governs the rate of respiration in animals. This gas is now being used with success as an accelerator of respiration following asphyxiation by drowning or by illuminating gas.

The Humidity Factor.

It is hard to separate temperature and moisture when considering air used for ventilation. The ordinary thermometer has a dry bulb. With dry bulb at 60° and heavy moisture, our senses tell us we are about as comfortable as with dry bulb at 80° and little moisture. When we heat

air by rubbing it over dry, hot plates, we expand its volume very greatly, but its moisture content has no opportunity to increase proportionately. Imagine a sheet of rubber such as we use for toy ballons. Paint it with white paint at its normal size. You can see the paint separating into tiny particles when you stretch the rubber, until at high tension the paint has disappeared.

We take perfectly good, well balanced outside air which carried from 50 per cent to 100 per cent of the amount of moisture it can carry, depending on the sun, the time of day and some other factors, and we heat it until it has expanded until it carries only 30 per cent to 35 per cent, or even less, of the amount of moisture it can carry. It proceeds to get very busy stealing the missing moisture wherever it may. It gets much from our skins, lips and throats. Whenever water changes from a liquid to a gas by evaporation, heat is used. The heat comes from our bodies, so that following evaporation we may feel cool at 80 degrees dry bulb, with low humidity.

All animals are provided with evaporating surfaces somewhere for cooling them when cooling becomes necessary—witness a dog's tongue. If the air hasn't much motion and is already loaded with moisture, animals can't get cool quickly and satisfactorily, so may feel warm at as low as 60 degrees dry bulb and a high humidity.

The wet bulb takes cognizance of these facts and will come to be the method of measuring temperatures for comfort.

A constant stream of comfortably warmed outside air will fulfill the foregoing requirements far better than the shut in, rebreathed, re-rubbed-over air of a room, even though we admit that walls are porous and windows have cracks.

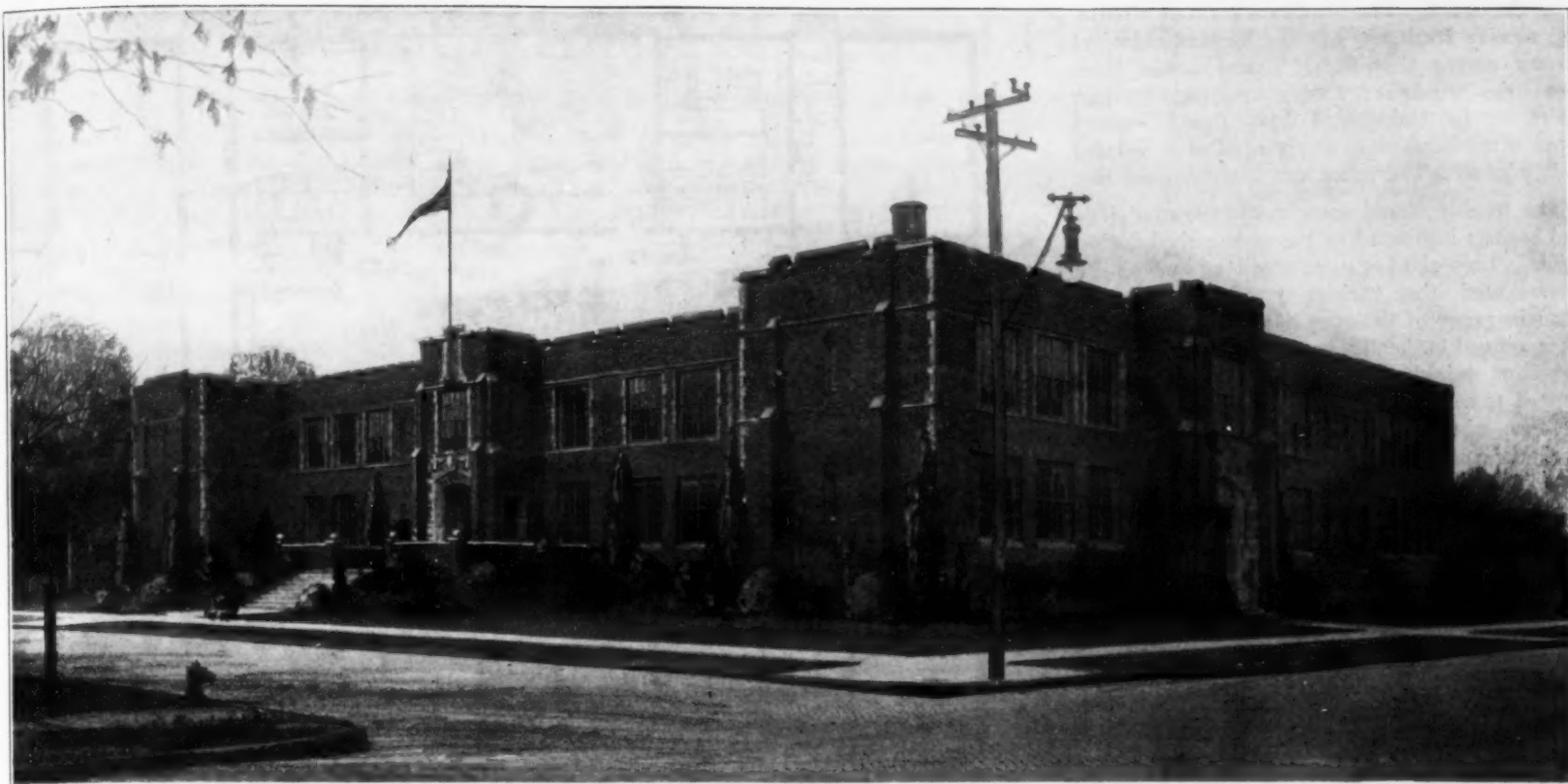
The Seven Types of Systems.

Here are some of the important ways of heating and ventilating school buildings:

1. Gravity systems, with hot air or steam.
2. Direct steam, with window ventilation.
3. Split steam, with direct radiation ample to heat the buildings, and with fans for ventilation.
4. Hot air furnaces, with fans driving the air over furnaces and delivering it for heating and ventilation to the rooms.
5. All blast steam, without direct radiators in the classrooms, with fans driving the air over radiators and delivering it for heating and ventilation to the rooms.
6. Unit heaters, having encased radiators with separate built-in fans for each radiator, taking air from windows.
7. All blast steam, having separate mixing dampers for each classroom and provided with the equivalent of direct radiators without having direct radiators.

The hot air furnaces operating by gravity are old-timers. They are probably the lowest first-cost combined heating and ventilating apparatus for schools. To achieve results it is necessary to have large vent flues, preferably combined into one great chimney, say for each four classrooms and to have a stove in the chimney to induce the draft so that it shall move the large volumes of air required.

It is not possible with gravity furnace plants satisfactorily to heat any basement rooms with-



OLENTANGY SCHOOL, COLUMBUS, OHIO. Howard Dwight Smith, Architect.

This building has an electrically operated vacuum system of steam circulation which can be bypassed for an emergency gravity circulation. There is a separate apparatus for heating the gymnasium. There are no radiators in the classrooms.

out very special arrangements, and if corridors are heated, it is necessary usually to provide separate furnaces. There is some danger of gas and dust contamination of the air.

Gravity Ventilation.

Gravity steam systems may be designed with facility, to do all that gravity furnace systems will do; and with steam, corridors, offices, basement playrooms, toilets, etc., may be heated with radiators. Too often, however, where gravity steam systems are used the classrooms have radiators which do the heating, and the ventilation, being secondary, is soon neglected.

Gravity arrangements of the kind technically called direct-indirect, having openings through the outside walls to admit air under and between the radiator sections, should be condemned as worthless, as far as ventilation is concerned. Neither the temperature or volume or dirt can be regulated, and the room, being at the mercy of the winds, must for self-protection soon be deprived of fresh air by the enforced closing of the inlets. There are, however, many steam heated school buildings operating by gravity without any radiators in the classrooms, using several layers of indirect radiation, with heated chimneys, and giving very good service.

With any gravity system, as the difference in temperature, inside and outdoors, increases, the heated chimneys become more effective, and when 40 degrees difference or more exists, reasonable ventilation may be accomplished. For small schools, say up to four classrooms each, and for portables, it is probable that gravity systems must be used. Where electric current is available, especially in portable schools having jacketed stoves, comfort and health are promoted by the operation of local fans to induce consistent currents of air. An ordinary sixteen-inch desk fan will work wonders. Two two or four blade vertical axle ceiling fans per room are very effective in aiding an optimum of air temperature and motion.

With gravity systems operating with slightly less pressure in the building than exists outside, the windows must be very tight. Any open windows or leakage exerts a marked detriment

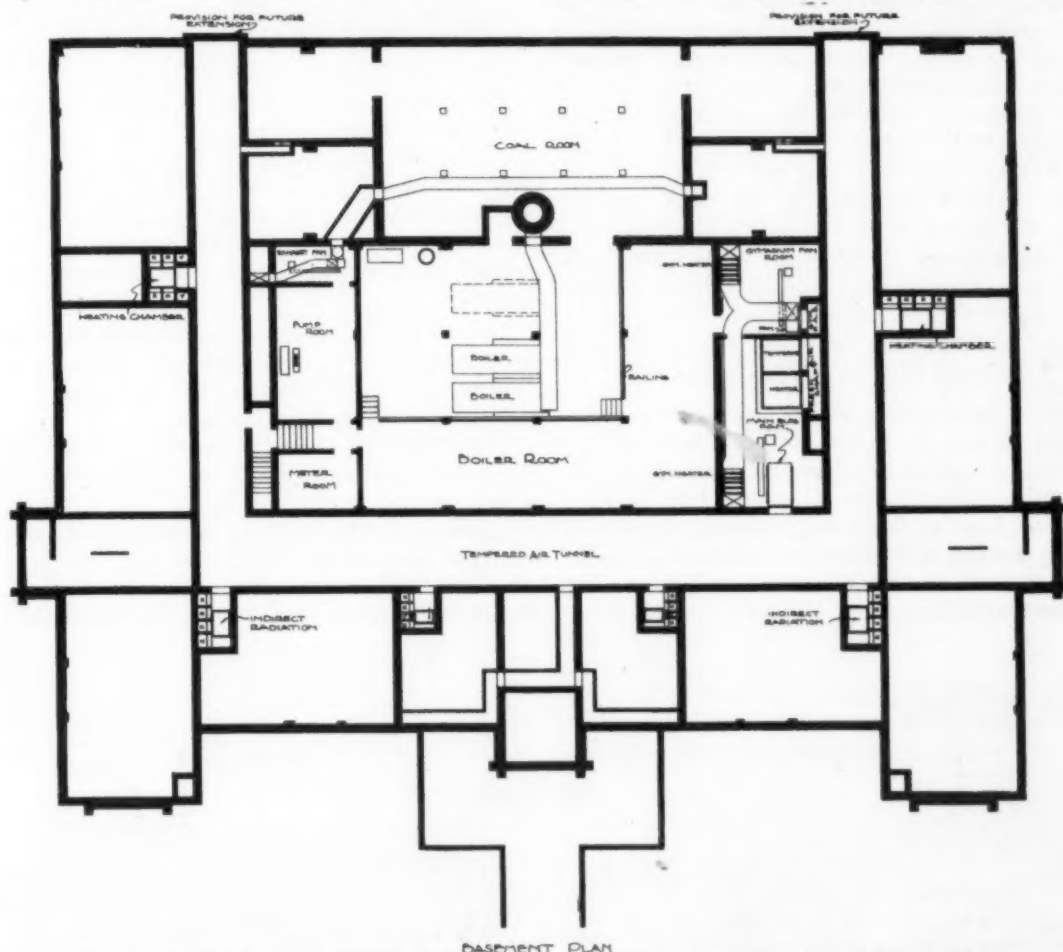
to the operation of the plant and may affect seriously the ventilation of other rooms in the building. Here we find the basis for the popular belief that windows in school buildings must be kept closed perfectly tight.

With any proper modern heating and ventilating system the windows in any room may be opened as much as pleases the occupants without affecting the ventilation of any other rooms.

A virtue of gravity systems without radiators in the classrooms is that with them it is necessary to ventilate in order to furnish heat.

Window Ventilation with Steam Heating.

Direct steam heating with window ventilation is low in first cost. As commonly operated it is low in fuel consumption. If operated consistently as a ventilating system it is exceedingly high in fuel consumption. As observed in operation in many buildings, it is possible to achieve ventilation, using windows, only with expert attention and only when there is a breeze or when it is quite cold outside. The drafts are exceedingly unpleasant and a menace to the children who must sit in range of the inlet, or who are



BASEMENT PLAN, OLENTANGY SCHOOL, COLUMBUS, OHIO. Howard Dwight Smith, Architect.

The boilers are smokeless, with provision for a future addition. There are separate toilet and locker exhaust fans and separate gymnasium and classroom supply fans, all located in the basement. The air ducts are seven feet deep, and have electric lights. When the fan stops the building is heated by gravity sufficiently to protect flowers from freezing.

near the outlet. The windward sides of a building receive fresh air, but the leeward sides get no air except that which passes across them from the windward rooms by open corridor doors, or by leakage. I have found leeward room after leeward room in window ventilated buildings with bad odors and high temperature.

The teacher would open the windows a little and become interested in her pedagogical duties. After a time she began to stroll around as she interrogated the various pupils. When she came in range of the open window and the cold jet impinged on her back, she slammed the window shut quickly. Very soon the temperature jumped to 80, since things had been adjusted to the open window, and it became evident to the teacher's consciousness that the room was too hot. She then opened several windows. Imagine the effect of the icy drafts on the unprotected heads and bodies of the children!

Window ventilation will serve for a sleeping room, at night when one can cower under the blankets, but it does not answer for children confined to fixed seats in classrooms, especially as the drafts, like a coward, strike from behind.

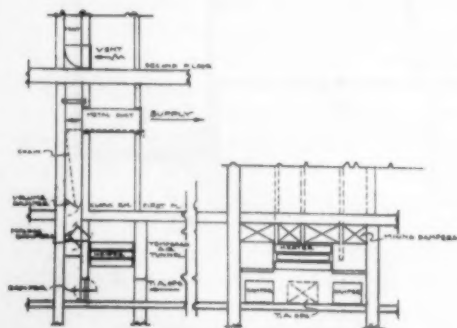
The So-called Split Systems.

The conventional split steam plants, having direct radiators and mechanical ventilation, are exploited because "the heating and the ventilation should be and are separate." No authority seems forthcoming as to *why* they should be separate. They are by no means separate functions with animals. The rooms can be heated without operating the fans. Therefore they are heated without operating the fans.

Authoritative testimony is to the effect that schools having split systems do not receive consistent ventilation. Since it takes much less coal and labor when the ventilation is shut down, the tendency is to shut it down.

I have found by personal examinations of the records of electrical consumption over a season in a large city having different kinds of school heating equipment, that where the all-blast schools consume around 4600 K. W. per classroom per season, the average of the split systems, presumably handling an equal amount of air, is around 3000 K. W. per classroom per season. This verifies the common knowledge and testimony that the split systems were not operated consistently. In one isolated case the cost of electric power for a split system, at one cent per K. W. hour, for a whole year was only 28 cents per classroom. They ran the fan only 82 hours during the year. This was a school building housing over 800 pupils and fully equipped with ventilating apparatus.

With split systems well designed, the air distribution *may* be at the optimum, but there is always a tendency, since the rooms can be heated by the radiators, to subordinate the ventilation, locating inlets and outlets as expedient, often causing short circuits and stagnant pockets. Too often the corridors and toilets are left unventilated.



DETAIL OF CHAMBERS

SECTIONS THROUGH HEATING APPARATUS, OLENTANGY SCHOOL, COLUMBUS, OHIO.



FLOOR PLAN

FIRST STORY PLAN, OLENTANGY SCHOOL, COLUMBUS, OHIO. Howard Dwight Smith, Architect. The gymnasium has direct exits and may be used separately. The plan is amenable to possible future additions. The inlets and outlets are arranged to promote good distribution of fresh air while insuring that the cloakrooms shall be ventilated.

Unless shields are placed between the pupils and the radiators, the pupils are baked by radiant heat.

With hot radiators parked against cold outside walls, the heat transmission losses are high.

Ground story rooms are considerably disfigured by pipes run in front of windows.

One hundred forty rooms in seven buildings having split systems average 10.3 tons of bituminous coal per classroom per season. It is significant in connection with these ostensibly well ventilated rooms that the building referred to above, in which the fan is operated so little as to use but 28 cents worth of power per classroom per year, burns 9.2 tons of bituminous coal per classroom per season. It seems to prove that the 140 classrooms, which are in the same city and which use the same grade of coal, are not ventilated very much more consistently, or their fuel consumption, influenced by the admitted cost of ventilating, would have been higher.

One state administration is prepared, from its experience with non-operated split systems, to permit no more of them in public schools.

Hot Blast Systems.

The difficulties of and objections to the gravity hot air furnace plants have led to an attempt at improvement by introducing pressure fans which should force the entering fresh cold air over and around the furnaces. The fans, when operated, create such a pressure as to force air into the fireboxes through the inevitable

joints and cracks, preventing the gas pollution complained of with gravity systems. Having a mechanical pressure behind the distributing ducts, it becomes possible to heat basement rooms. It becomes necessary to ventilate, in order to heat, the classrooms, which is an advantage.

Furnaces, however, bear a very heavy depreciation and maintenance expense, due to the relatively high temperature. A boiler plate, for instance, would melt down very quickly above a hot fire unless it were cooled by the water circulating against it. The furnaces are cooled by air only, and all the hotter surfaces have to be made of cast iron. In addition, the hottest surfaces must have heavy cast iron linings which burn out very frequently, and which, being proprietary, are expensive. A four year average repair account covering some eighty hot air furnaces with fans in school buildings shows that the iron repairs which must be purchased to be burned up cost one-fifth as much as does the coal.

No very satisfactory means of adding a controlled quota of moisture to the air when furnaces are used for heating has been found.

There are in any building of large area many rooms which are most satisfactorily and economically heated by radiators, but which of course are lacking, with hot air.

A hot air plant has no device which parallels the steam gauge and the safety valve of the steam plant. All the coal that can be burned may be burned unless the engineer will save it.

The all blast steam plant having a separate duct and mixing damper to each classroom, with thermostatic control so that each room may receive air at optimum temperatures regardless of the temperature of the air being delivered to the other rooms, has the advantages of the fan blast hot air furnace system, but usually costs much more to install. The rooms must be ventilated if they are heated. It is necessary for the engineer to be on the job early on cold mornings following holidays, because with entering air at only 110 degrees, say, it takes a long time, starting with a chilled building, to bring the temperature of the rooms up to 68 degrees. This is

(Concluded on Page 145)

The Retirement of School Bond Issues

John Guy Fowlkes, Assistant Professor of Education, University of Wisconsin.

Experience has proved that many of the difficulties which have arisen in connection with school bond issues are caused by one of two things: (1) an imprudent arrangement for the payment of the securities, and (2) the issuance of the bonds for an excessive term of years. Many of the problems that have been encountered in connection with these factors might have been avoided and it is the purpose of this article to suggest some principles that may help boards of education that are planning to issue school bonds.

Inasmuch as the name or type of bond is determined by the plan of payment, great care should be taken to inspect the methods of retirement that may be utilized in the amortization of school bond issues. The two types of bonds that may be used in issuing school bonds are (1) the straight or sinking fund bond, and (2) the serial bond.

A straight, or sinking fund bond, is one floated for a specified number of years, bearing interest annually, semi-annually or quarterly, all the principal being payable at date of maturity. For example, \$100,000 issued for and payable at the end of twenty years bearing interest at the rate of five per cent annually. Payment of straight or sinking fund bonds, as the name implies, is provided for by means of a sinking fund which may or may not be invested. A superficial inspection of the sinking fund plan of payment seems to establish its desirability; but a study of possible exigencies soon reveals certain serious weaknesses.

A good illustration of what may happen when provision for the payment of bonds is made by means of a sinking fund is the following: Fifty years ago a community needed \$100,000 to build a new school building. Enthusiastically and confidently this community borrowed \$100,000, issuing bonds payable at the end of twenty years from date of issue and bearing a five per cent rate of interest annually. At the end of twenty years, because of failure to levy taxes for a sinking fund, need of available money for current expenses and political aspirations, the original \$100,000 was paid by the issuance of a new series of bonds. When these twenty years ended in 1912, the process was repeated, as may be done again in 1932. The building for which these bonds were issued long since became obsolescent and has been destroyed. It is a striking example how this community has paid \$250,000 for a \$100,000 job done fifty years ago. It shows how public business may be conducted, why some communities are ever in need of more money, and why, because of inadequate buildings, some schools are forced to operate on a two-session basis. Unfortunately somewhat the same condition as cited above may be found in many communities throughout the United States. Affairs would have been much different had the payment of the original issue been provided for by the serial method. Since this is true, let us now turn to the provisions made for payment under the serial method and see wherein the advantages of the serial bond lie.

A serial bond is one that is retired by payments made at regular intervals, interest being paid annually, semi-annually or quarterly as desired. For example, \$100,000 issued for 1-20 years, bearing interest at the rate of five per cent annually; which means that payment will be made on the issue each year beginning one year from date of sale.

The decided superiority of the serial type of bond for all municipal securities of long-term

TABLE I.
Schedule for Payment of Twenty-Year Serial Bond Issue of \$500,000 at 5%, Annual Payments on Principal Being Equal.

End of	Payments on Principal	Interest Paid	Total Annual Payments
1st year	\$ 25,000	\$500,000	\$ 50,000
2nd year	25,000	475,000	48,750
3rd year	25,000	450,000	47,500
4th year	25,000	425,000	46,250
5th year	25,000	400,000	45,000
6th year	25,000	375,000	43,750
7th year	25,000	350,000	42,500
8th year	25,000	325,000	41,250
9th year	25,000	300,000	40,000
10th year	25,000	275,000	38,750
11th year	25,000	250,000	37,500
12th year	25,000	225,000	36,250
13th year	25,000	200,000	35,000
14th year	25,000	175,000	33,750
15th year	25,000	150,000	32,500
16th year	25,000	125,000	31,250
17th year	25,000	100,000	30,000
18th year	25,000	75,000	28,750
19th year	25,000	50,000	27,500
20th year	25,000	25,000	26,250
Total	\$500,000		\$762,500
Average	Per Year 25,000	13,125	38,125
Range of yearly payments—\$26,250 to \$50,000.			

standing, has been recognized by the leading authorities in municipal finance. Chamberlain,¹ The Daily Bond Buyer,² Financial Statistics of Cities,³ Commercial and Financial Chronicle,⁴ Engelhardt,⁵ and various special commissions have furnished evidence of the desirability of the serial plan of payment. Massachusetts, New Jersey, North Carolina, and Wisconsin have for some time required school bonds to be retired on the serial basis. Ohio recently imposed a similar law which Mr. Robert Denison⁶ discussed in the following manner: "This Act introduces two quite radical changes in Ohio Laws for the ultimate security both of the political subdivisions and of the investor. The first of these provisions was that all bonds must hereafter be serial bonds to mature in substantially equal annual installments. A bond buyer, looking at bonds from his own standpoint, figures that an issue of straight thirty years is a better investment than one maturing in from three to thirty years, but every bond purchaser and every bond salesman ought to bear in mind that the best thing for him in the long run, is that which works out as the best thing for the political subdivision and a serial bond ultimately works

TABLE II.
Schedule for Payment of Twenty-Year Serial Bond Issue of \$500,000 at 5%, All Total Annual Payments Being Approximately Equal.

End of	Payments on Principal	Interest Paid	Total Annual Payments
1st year	\$ 15,000	\$500,000	\$ 50,000
2nd year	16,000	465,000	48,250
3rd year	17,000	430,000	46,500
4th year	18,000	395,000	44,750
5th year	19,000	360,000	43,000
6th year	20,000	325,000	41,250
7th year	21,000	290,000	39,500
8th year	22,000	255,000	37,750
9th year	23,000	220,000	36,000
10th year	24,000	185,000	34,250
11th year	25,000	150,000	32,500
12th year	26,000	115,000	30,750
13th year	27,000	80,000	29,000
14th year	28,000	45,000	27,250
15th year	29,000	10,000	25,500
16th year	30,000		23,750
17th year	31,000		22,000
18th year	32,000		20,250
19th year	33,000		18,500
20th year	34,000		16,750
Total	\$500,000		\$799,850
Average	Per Year 25,000	14,992.50	39,992.50
Range of yearly payments—\$38,500 to \$40,750.			

¹Chamberlain: Principles of Bond Investment, pp. 216-218.

²The Daily Bond Buyer, March 26, 1917.

³Financial Statistics of Cities, 1916, p. 101.

⁴Commercial and Financial Chronicle, State and City Section, May, 1905.

⁵Engelhardt: A School Building Program for Cities, p. 115.

⁶Denison, Robert F.: The New Ohio Municipal Bond Law, p. 18.

out best for the political subdivision because the interest charge isn't so great and the political subdivision is obliged to pay such bonds as it goes along. The serial bond, in other words, produces in effect a pay-as-you-go policy which we have previously had as to operating expenses."

However, it is a mistake to think that a school district automatically saves any money through the adoption of the serial plan. If the same assumptions as to rates of interest and accumulation are established, the total payments will be the same on either the sinking fund or serial plan. The inherent advantages of the serial system are administrative and political rather than financial but, because of lax control and indiscreet management of sinking funds, the serial plan has proved to be superior on a financial as well as on an administrative basis.

The following opinions show the prevalent attitude toward the sinking fund:

"The cost to the community of issuing serial bonds is exactly the same as the cost of issuing so-called 'straight' or 'sinking fund' bonds, maturing all at one time, provided that the sinking fund earns interest at the same rate that the bonds bear. But in spite of this fact, municipal sinking funds are not usually maintained as they should be, and it has seemed to be impossible to prevent mismanagement and losses of such funds."¹

"I presume that there are a great many, even of our best and most financially sound, municipal corporations of this state, if you put an expert accountant on their books, you would discover that they didn't have the proper sinking fund on hand, because they hadn't levied it. Every public official, whether he has such a view when he enters office or not, before he gets through, sees the demand for money for operating expenses, tries to keep down the tax rate and the amount to be raised by taxation, and is tempted to cut off paying something that falls due fifteen, twenty or twenty-five years hence, which is something for somebody else to worry about, as he wants all he can get at present."²

Since the decided advantage of the serial bond over the straight bond is apparent, it is now expedient to ascertain the different possible schedules in the serial plan of payment and to select the method most desirable for the local need. There are five possible schedules in the serial plan of payment which are as follows:

(1) The annual installment plan in which the annual payments on the principal are equal, illustrated by Table I.

(2) The annuity system in which, as shown by Table II, the total annual payments are approximately equal.

(3) A schedule in which the annual payments on the principal are unequal and the largest annual payments on the principal come within the years immediately following date of issuance. See Table III.

(4) A schedule in which the annual payments on the principal are unequal and which calls for small annual payments on the principal during the years immediately following date of issuance. See Table IV.

(5) A schedule which provides for no payment on the principal for a period of years immediately following date of issuance, and then employs one of the four plans just set forth. See Table V.

¹Hoyt, William Henry: "Municipal Bonds," reprinted from the Daily Bond Buyer, p. 3.

²Denison, Robert F.: The New Ohio Municipal Bond Law, p. 17.

TABLE III.

Schedule for Payment of Twenty-Year Serial Bond Issue of \$500,000 at 5%, Largest Annual Payments Being Made During the First Ten Years.

Amount of Principal			
End of	Payments on Principal	Upon Which Interest Was Paid	Total Annual Payments
1st year	\$ 40,000	\$500,000	\$ 25,000
2nd year	40,000	460,000	23,000
3rd year	35,000	425,000	21,250
4th year	35,000	390,000	19,500
5th year	25,000	365,000	18,250
6th year	25,000	340,000	17,000
7th year	25,000	315,000	15,750
8th year	25,000	290,000	14,500
9th year	25,000	265,000	13,250
10th year	25,000	240,000	12,000
11th year	20,000	220,000	11,000
12th year	20,000	200,000	10,000
13th year	20,000	180,000	9,000
14th year	20,000	160,000	8,000
15th year	20,000	140,000	7,000
16th year	20,000	120,000	6,000
17th year	20,000	100,000	5,000
18th year	20,000	80,000	4,000
19th year	20,000	60,000	3,000
20th year	20,000	40,000	2,000
Total	\$500,000		\$244,500
Average			
Per Year	25,000		12,225
Range of annual payments			\$22,000 to \$65,000.

Little comment is needed to show the undesirability of the schedule of payment illustrated by Table V. It is exceedingly costly and tends to defeat the very purpose of the serial plan of payment.

Either of the first four schedules may be used advantageously. For the sake of economy, however, Schedule I or III is more desirable than either of Schedules II or IV. In Schedule III the total cost of the issue may be reduced if the first annual payments are made larger than those suggested here. This is hardly practicable in the usual community, inasmuch as the schedule now calls for the payment of sixty per cent of the issue in the first ten years.

Closely associated with the schedule of payment that shall be used in retiring school bond issues, is the length of time for which the securities shall be floated. In the past, communities have been prone to shift the responsibility of payment, in part at least, to later generations, thereby imposing a burden upon

TABLE IV.

Schedule for Payment of Twenty-Year Serial Bond Issue of \$500,000 at 5%, Smallest Annual Payments Being Made During the First Ten Years.

Amount of Principal			
End of	Payments on Principal	Upon Which Interest Was Paid	Total Annual Payments
1st year	\$ 20,000	\$500,000	\$ 25,000
2nd year	20,000	480,000	24,000
3rd year	20,000	460,000	23,000
4th year	20,000	440,000	22,000
5th year	20,000	420,000	21,000
6th year	20,000	400,000	20,000
7th year	20,000	380,000	19,000
8th year	20,000	360,000	18,000
9th year	20,000	340,000	17,000
10th year	20,000	320,000	16,000
11th year	25,000	295,000	14,750
12th year	25,000	270,000	13,500
13th year	25,000	245,000	12,250
14th year	25,000	220,000	11,000
15th year	25,000	195,000	9,750
16th year	25,000	170,000	8,500
17th year	35,000	135,000	6,750
18th year	35,000	100,000	5,000
19th year	40,000	60,000	3,000
20th year	40,000	20,000	1,000
Total	\$500,000		\$290,500
Average			
Per Year	25,000		14,525
Range of yearly payments			\$33,500 to \$45,000.

a group of people who were not the beneficiaries. This is undemocratic as well as financially unsound. It is unwise to issue school bonds for a term of years that exceeds the period for which adequate service will be provided.

The length of time a school bond issue is to run should depend upon the needs of the gen-

TABLE VI.

Schedule for Payment of Ten Year Serial Bond Issue of \$500,000 at 5%.

Amount of Principal			
End of	Payments on Principal	Upon Which Interest Was Paid	Total Annual Payments
1st year	\$ 50,000	\$500,000	\$ 25,000
2nd year	50,000	450,000	22,500
3rd year	50,000	400,000	20,000
4th year	50,000	350,000	17,500
5th year	50,000	300,000	15,000
6th year	50,000	250,000	12,500
7th year	50,000	200,000	10,000
8th year	50,000	150,000	7,500
9th year	50,000	100,000	5,000
10th year	50,000	50,000	2,500
Total	\$500,000		\$137,500
Average			
Per Year	50,000		13,750
Range of yearly payments			\$52,500 to \$75,000.

TABLE V.

Schedule for Payment of Twenty-Year Bond Issue of \$500,000 at 5%, No Payment Being Made on Principal Until the End of the 11th Year.

Amount of Principal			
End of	Payments on Principal	Upon Which Interest Was Paid	Total Annual Payments
1st year		\$500,000	\$ 25,000
2nd year		500,000	25,000
3rd year		500,000	25,000
4th year		500,000	25,000
5th year		500,000	25,000
6th year		500,000	25,000
7th year		500,000	25,000
8th year		500,000	25,000
9th year		500,000	25,000
10th year		500,000	25,000
11th year	\$ 40,000	500,000	25,000
12th year	42,000	460,000	23,000
13th year	44,000	418,000	20,000
14th year	46,000	374,000	18,700
15th year	49,000	328,000	16,400
16th year	50,000	279,000	13,950
17th year	53,000	229,000	11,450
18th year	56,000	176,000	8,800
19th year	59,000	120,000	6,000
20th year	61,000	61,000	3,050
Total	\$500,000		\$397,250
Average			
Per Year	50,000		19,862.50
Range of yearly payments			\$25,000 to \$65,000.

eral school building program as well as the estimated life of the new buildings that are erected immediately. For the sake of economy the term of years should be as small as possible for the interest that is paid in a long term bond issue quite often equals the original principal. This is very strikingly revealed by comparing Table VI with either of Tables I, II, or III. From this comparison it is seen that a \$500,000 bond issue of ten years requires approximately only half as much interest as a \$500,000 bond issue of twenty years.

It is evident from the foregoing discussion that the utmost care should be exercised in providing for the payment of school bonds and in determining the length of time they should run. It is sincerely hoped that it will soon be legally impossible to refund school bond issues by floating new securities. It is again urged that only the serial plan of payment be employed in the retirement of school bonds, and that the life of a school bond issue be reduced to the lowest practicable minimum.

Rooms and Equipment for a Department of Agriculture

Samuel A. Challman, St. Paul, Minn.

It would often seem as if the most practical things in life are the hardest to teach in school. Agriculture with its numerous practical problems has proved an especially difficult subject for our public schools. They have actually shied at including it in the curriculum, largely because of the difficulty of reducing the subject to such content that it would meet with public approval. But legal requirements, and inducements in the form of state and federal aid have gradually tended to establish the subject on a permanent basis as a part of the accepted school curriculum.

Its first introduction into the schools followed the traditional manner of teaching, much after the fashion in which botany, zoology, physics, or chemistry were taught. This was a natural development, since agriculture is an industry which involves many sciences. Rooms and equipment were provided much after the same plans that were used for any one of the sciences. This meant ordinarily a recitation room, a laboratory, and storage room.

To those, however, who gave intelligent direction to the work in agriculture, it gradually became evident that its presentation in the schools as a science was not producing satisfactory results. This led to a modification of

the courses so that in addition to the laboratory work there was introduced a certain amount of shop work. Some of the laboratory equipment was dispensed with, and wood-working benches were substituted for a part of the discarded laboratory tables. Some farm machinery was brought in and outside doors to the laboratory provided. The recitation room remained very much as it had been, except that partial provision was made for such laboratory work as had a direct bearing upon the recitation. The work done in both rooms was getting closer to the problems which confront the farmer.

The Most Recent Development.

Only lately another step has been taken in promoting the practical teaching of the subject. Paul Calrow, state supervisor of agricultural education in Minnesota, in conjunction with the College of Agriculture of the University of Minnesota and with the aid of other men in agricultural positions, both within and without the state, has developed a plan for the teaching of the subject which recognizes the segregation of the shop work from the laboratory and which combines the laboratory work with the recitation. This plan meets the requirements of the Federal Board of Vocational Education and is endorsed by W. F. Stewart,

professor of agricultural education of the University of Ohio, who is now employed by this board to make a special study of space and equipment for agricultural instruction in secondary schools.

The two diagrams of floor space herewith presented show how these rooms may be made to provide for a minimum equipment such as would be necessary to carry out the purposes of the course. Plan No. 1 readily adapts itself to any building where the rooms are all along the same outside wall. Plan No. 2 will fit into end of a building and has been prepared largely for schools, where evening and vacation classes are maintained in addition to the regular classes of the school. In this plan the inner vestibule doors may be closed so as to shut off the rest of the building, and entrance obtained to the recitation room directly from the vestibule. The agricultural department thus becomes a unit within the building, which can be conveniently used, whenever occasion requires.

Plans for One Instructor Schools.

Both plans have been drawn for schools that employ but one instructor. Plan No. 1 has but one door to the corridor and this is in direct line with the instructor's desk. Plan No. 2 has one door from the vestibule and one from

the corridor, both within easy control of the instructor. Both plans provide for a direct outside exit of sufficient size to allow for bringing in farm animals and farm machinery. These general features are of vital importance in the successful maintenance of an agricultural department.

The rooms have been designed for classes of sixteen pupils. In the laboratory and recitation room, the tables have been made of a size for two pupils, and so arranged that all the pupils face in one direction. Each pupil has table space of 36"x28" which gives him ample space for his books and materials. The light for all pupils comes in at the left, and the window area is twenty per cent of the floor area. Chairs instead of stools are recommended, in order to give proper physical comfort.

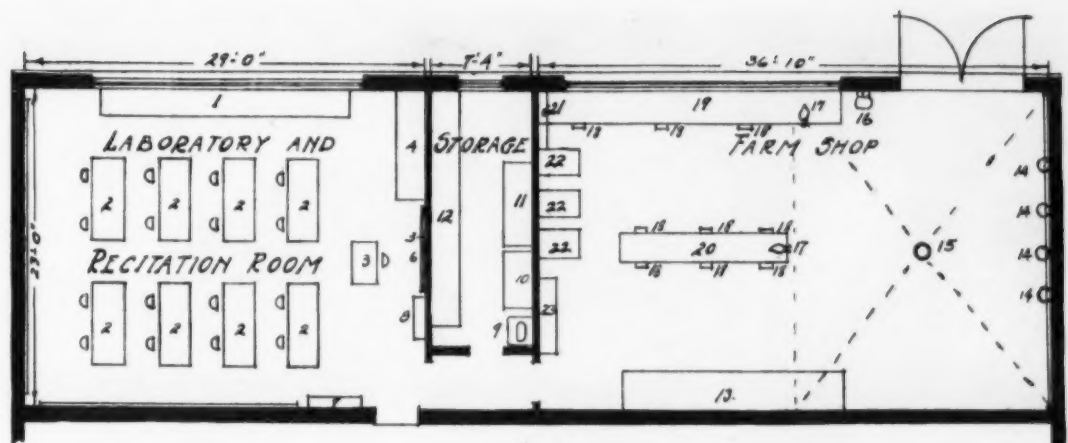
U. and T. Arrangement.

In making these recommendations for tables and chairs, due consideration has been given to such arrangements as have been suggested from time to time, such as the "U" arrangement in which the pupils are seated around the outside of the tables, and the teacher at the open end of the "U"; and also the "T" arrangement with the teacher at the upper end of the T opposite the straight bar. Both of these arrangements have certain advantages in the grouping which they facilitate, but they are very objectionable on account of compelling about one-half of the pupils to face the windows.

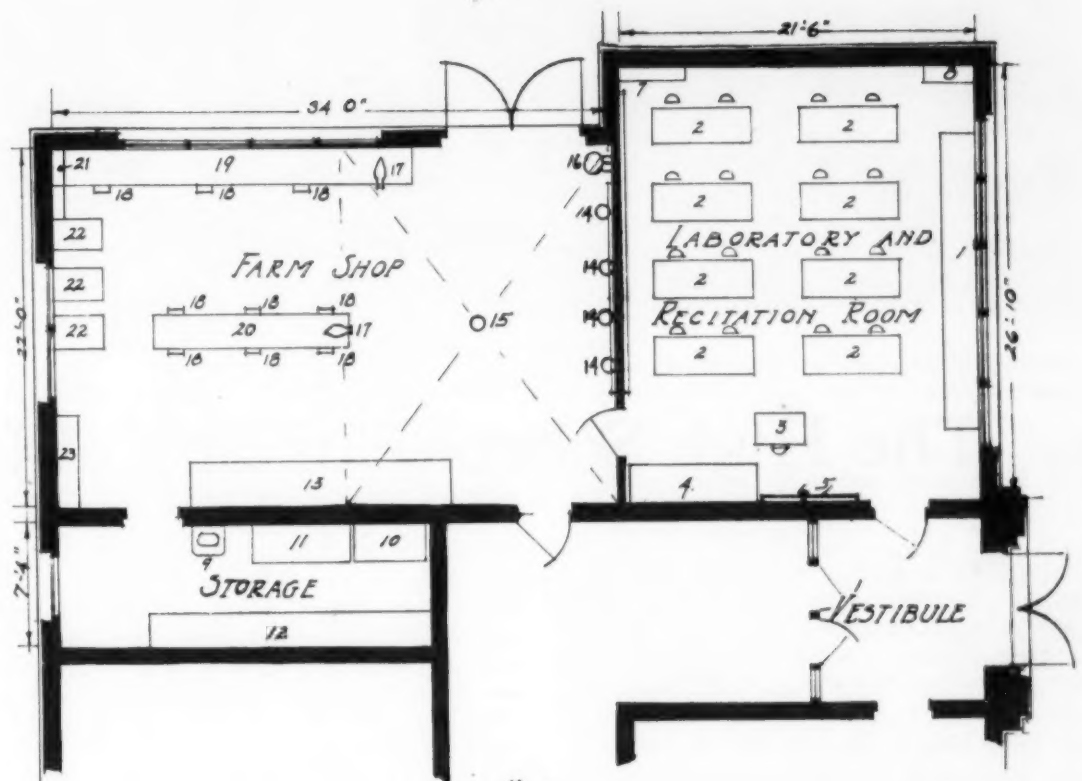
The shelf along the windows is a laboratory table which is especially valuable in milk testing and work with soils. Blackboards have been provided along two sides of the room and a small blackboard has been placed in front for the instructor's use. A lantern screen can be rolled down over the front blackboard. A large display cabinet for grains and materials in glass containers is located in the front of the room so as to make it readily accessible for recitation purposes. A periodical rack and book and bulletin case complete the equipment for this room.

The storage room is arranged to provide space for a supply case which is divided into compartments. The lower part of the case is made up of bins suitable for the storing of soils and farm products. The upper part is divided into spaces for the storage of various grains and seeds. In addition, closets are provided for cement tools and working clothes. A lavatory with a mirror above it is also added to equipment.

The shop has been planned to give opportunity to carry on the repair work which is ordinarily done on the farm. There are two long benches with vises, a tool cabinet, a harness cabinet, a lumber rack, and a space for gas engines. The floor of half of this room is an ordinary wooden floor, while the other half is a wood block floor on a concrete base. Farm machinery, autos, wagons, and other equipment can be taken in on this wood block floor and studied or repaired. Farm animals can also be brought in, and tie rings have for convenience



No. 1



No. 2.

SUGGESTIVE PLANS FOR A DEPARTMENT OF AGRICULTURE IN A RURAL HIGH SCHOOL.

Equipment Schedule: 1. Shelf 18' x 22" with acid proof trough leading to drain. 2. Table 72" x 28". 3. Teacher's desk 36" x 23". 4. Display cabinet 7'-10 1/4" x 7 1/2" for grain and glassware, upper section 12" deep, lower section 24" deep. 5. Lantern screen—6' wide. 6. Slate blackboard 6' x 3'-6". 7. Periodical rack 48" x 12" x 6'-10". 8. Book and Bulletin Case 36" x 8" x 6'-10". 9. Lavatory 28" x 21 1/2". 10. Clothes closet 48" x 24". 11. Closet for cement tools, 72" x 24". 12. Supply case and shelf 17' x 2', with corn trays, soil bins, etc. 13. Lumber rack 16' x 3' x 6 1/2". 14. Tie rings. 15. Drain. 16. Post Drill. 17. Machinist Vise. 18. Wood Vise. 19. Bench 22' x 28". 20. Movable table 12' x 48". 21. Harness cabinet 4' x 8" x 3'. 22. Gas engines 3' x 2'. 23. Tool cabinet 5'-6 3/4" x 17 1/4" x 6'.

been placed in one wall. Above the rings is a blackboard which will prove an added advantage.

These plans are not intended to cover all situations which may arise in planning an agricultural department. They are mainly suggestive, and variations and modifications are to be expected in attempting to incorporate them into buildings which have a great many other purposes to serve. They have the value of having been worked out with care and with purposeful consideration for the objects for which an agricultural education is offered.

Essentials of a Good School System.

The impression gained by the data gathered from sixty of the more progressive cities warrants the statement that while commendable progress is being made many do not appreciate the fact that "the health of the oncoming generation is a priceless asset to the community." It notes the more significant elements as follows:

1. The increasing number of cities maintaining open air schools or classes thus salvaging imperfect human material and converting it to a high grade product.
2. The increasing number of cities providing milk for the undernourished school children.
3. The increasing number of cities providing a hot lunch or a hot dish for all elementary school children.

Two facts which merit careful consideration are:

1. The absence of medical examination before children are admitted to the schools. (Less than forty per cent of the communities take this essential precaution to safeguard the health of the community.)
2. The lack of adequate playgrounds where all the children can add to their store of health and strength. (Only 42 per cent of the cities claim adequate facilities.)

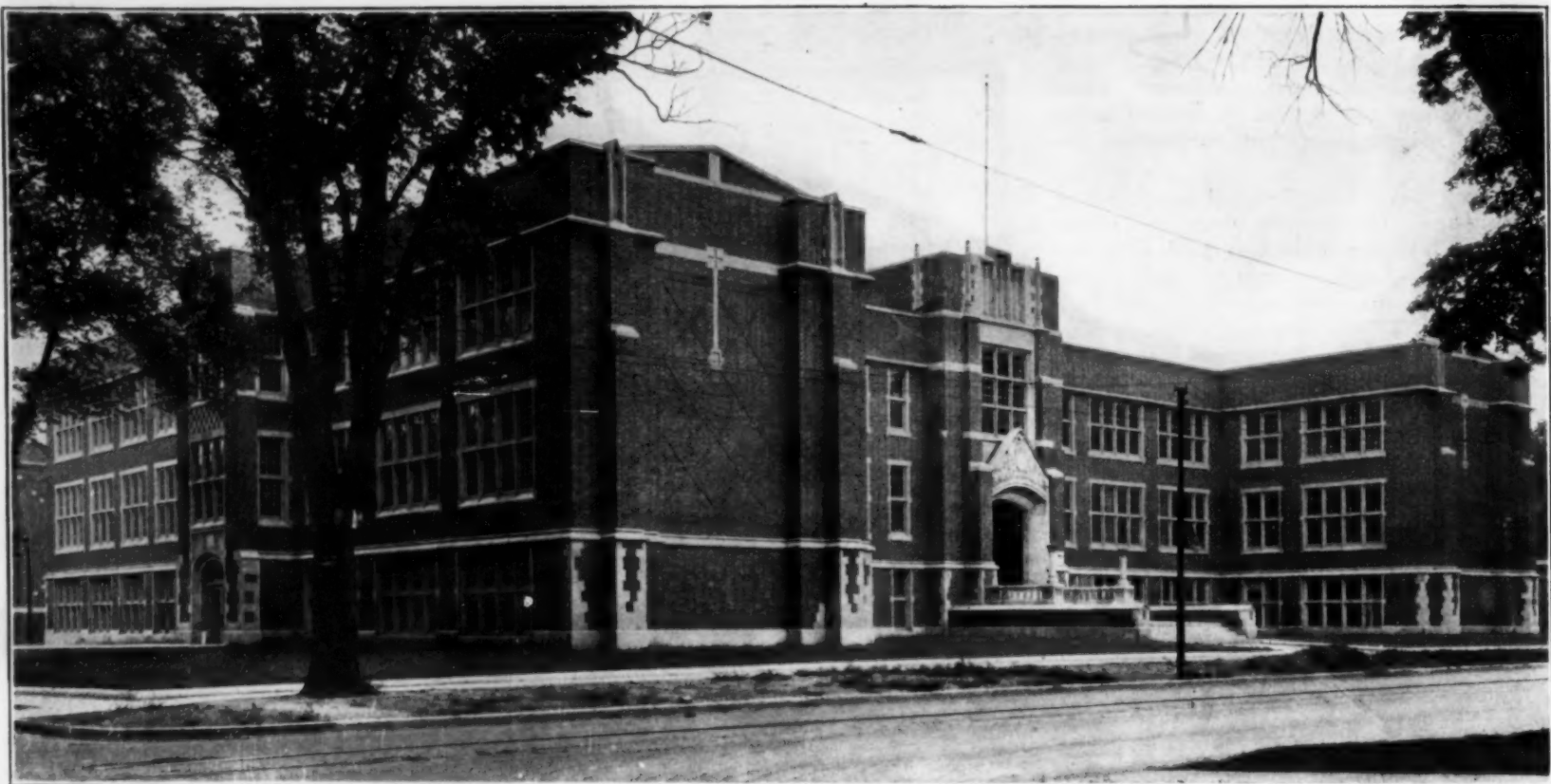
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A Business Man's School Inventory

The Chamber of Commerce of the United States Makes a National School Survey.

The national business men's organization, known as the Chamber of Commerce of the United States, recognizes that the promotion of trade and commerce, in its larger and deeper aspects, implies also due consideration of the educational activities of the nation. Hence, it concerns itself with certain phases of the educational life of the country for the purpose of stimulating and encouraging well directed efforts.

The survey engaged in by the business men's organization deals with school buildings and equipment and is intended more largely to determine upon the health and physical education fostered by the several school systems. In a report made on its findings it explains that the results are not complete but believes them to be sufficiently fulsome to be at least indicative of general conditions.



HIGH SCHOOL, JACKSONVILLE, ILL. Joseph W. Royer, Architect, Urbana, Ill.

The High School Building at Jacksonville, Ill.

H. Ambrose Perrin, Superintendent of Schools.

The new Jacksonville high school building is a memorial to Newton Bateman, who was a former school officer in the city of Jacksonville, and who later became the first state superintendent of public instruction for Illinois. The building is Gothic in design and fireproof in construction. The exterior walls are of vitreous brick, with stone trimmings and cornices.

It has a total cubage of approximately one million cubic feet. It is 187 feet long, 144 feet deep, and three stories in height. Practically the entire building is above ground level.

Two corridors join the new building to the junior high school which is on an adjacent block. This makes the inter-use of the two buildings for various purposes convenient and possible. The heating plant for this group is situated one block away and is connected by a man-size tunnel.

Some of the particular features of the building are: Well lighted corridors with sanitary terrazzo floors, mastic fireproof floors throughout the rest of the building, a split system of heating and ventilating, lavatories on each floor, an auditorium with one thousand seating capacity, so situated that it can be used for community purposes during the regular school session.

The building is planned to be used on the locker home system. These lockers are built in the walls of the building and are ventilated to the roof. Each student has an individual home locker where he keeps not only his wraps but all books, papers, and school material belonging to him. This economizes in study hall space inasmuch as no permanent home seat is assigned.

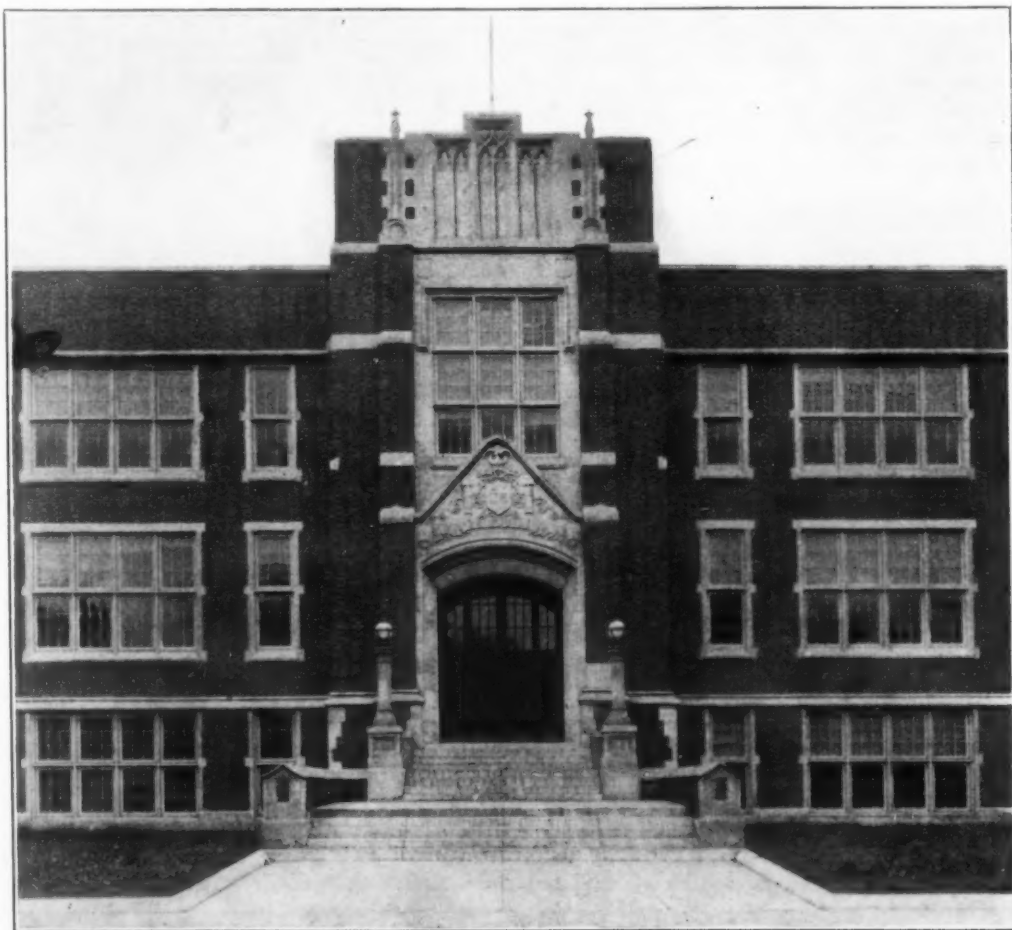
One of the particular features of the building is its departmentalization. Groups of rooms for subjects which are closely related are physically related by special arrangement. This makes it possible to inter-use apparatus, lecture rooms, etc.

On the first floor is the manual training department, consisting of quarters for woodwork,

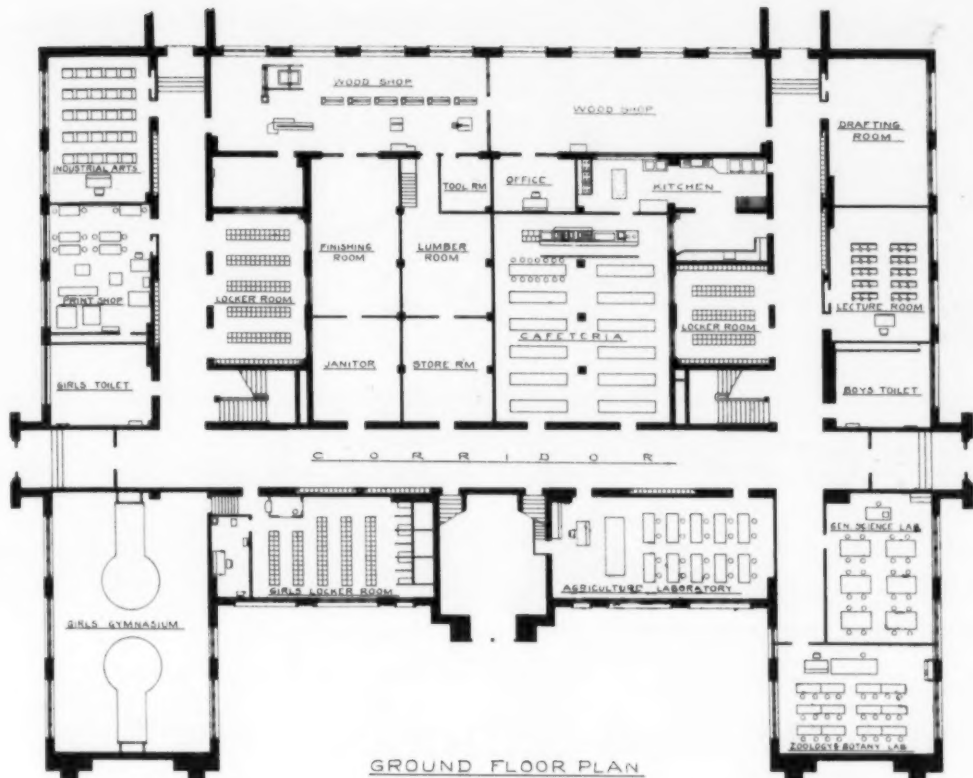
machine, drafting, industrial arts, and printing. The biological science group consists of quarters for agriculture, zoology, botany and general science. A special gymnasium for girls and adjacent locker, dressing and shower bath accommodations form one of the important units. (The regular gymnasium for the junior-senior high school is a large one in the junior high school building which is connected by cor-

ridors.) This floor also accommodates a cafeteria with kitchens, store room, etc.

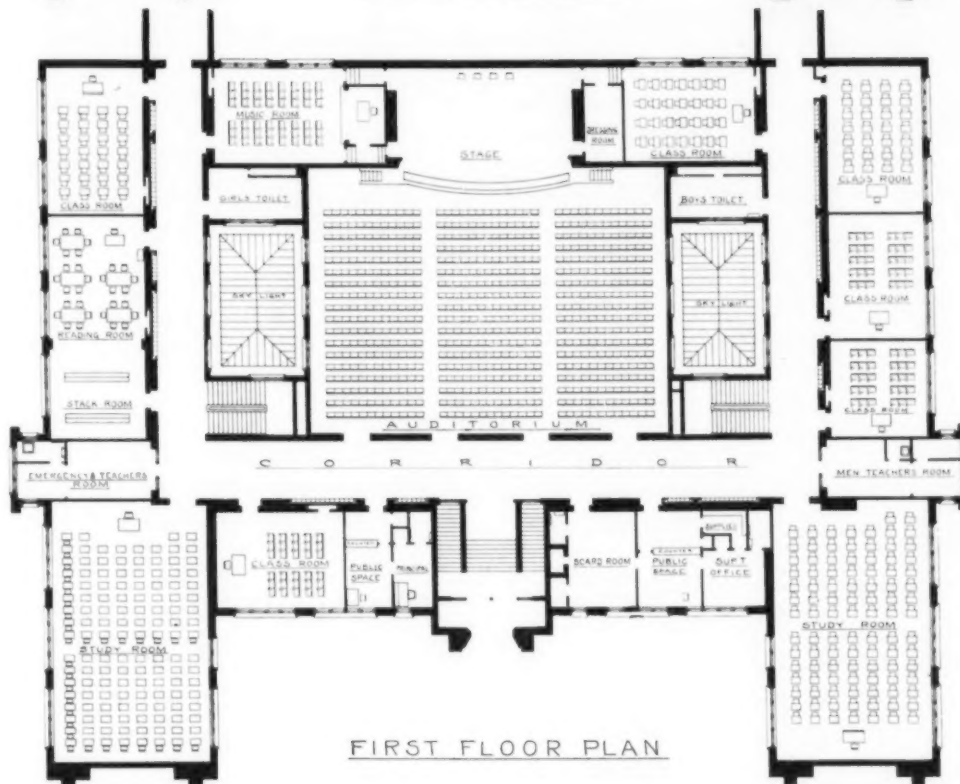
On the second floor, near the main entrance, are to be found the general offices consisting of quarters for the board of education, superintendent and high school principal. Opposite the main entrance is the auditorium. It is easily accessible for direct entrance and has ample exits. Two study halls of relatively small size



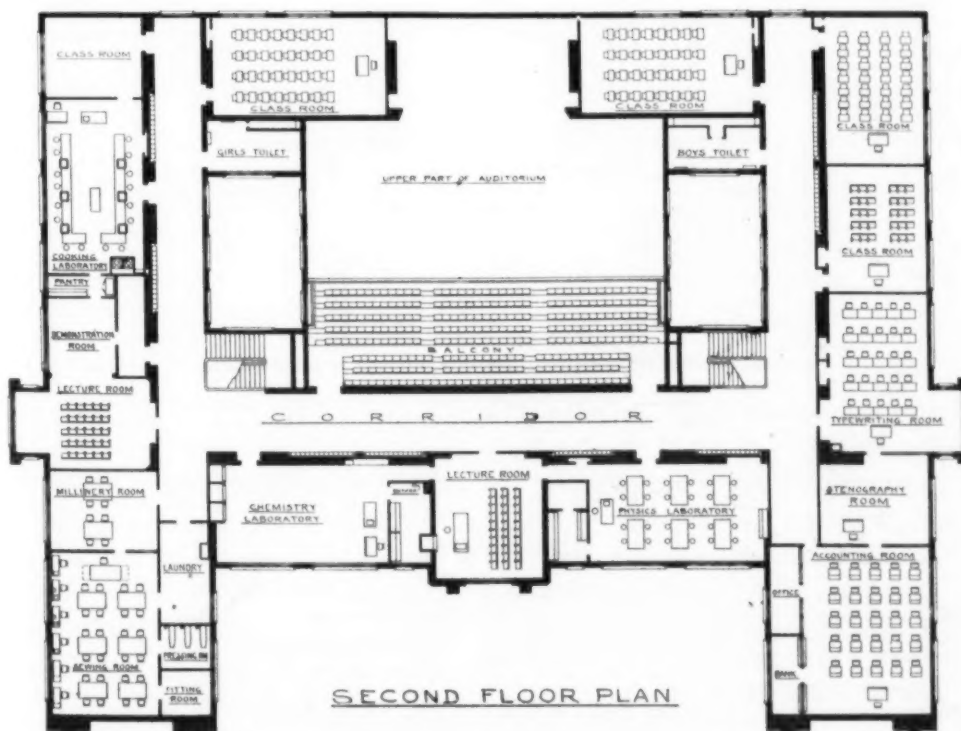
DETAIL OF FRONT ENTRANCE, HIGH SCHOOL, JACKSONVILLE, ILL.



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

FLOOR PLANS OF HIGH SCHOOL, JACKSONVILLE, ILL.

are shown to be ample for approximately one thousand students by the use of the locker home system. At present there are about six hundred students in high school, but fifty per cent more could easily be accommodated. On this floor may be found the library, six classrooms, one music room with a small stage, and two rest rooms for teachers, both of the latter having private lavatories.

The entire east wing of the third floor is given over to the business department. Quarters are provided for bookkeeping, banking, typewriting, stenography, and classrooms for other commercial subjects. The entire west wing forms the home economics department, consisting of quarters for sewing, millinery, fitting, pressing, laundry, a two-room demonstration housekeeping suite, a cooking laboratory, and a special classroom. The physics-chemistry science group, together with a common lecture room, occupy the front center on this floor. It also contains the entrance to the balcony of the auditorium.

Special pains have been taken to make the corridors sanitary with terrazzo floors, and wainscoting of enameled brick. On the first floor white enameled brick was used; on the second and third floors, brown enameled brick. The staircases and lavatories are finished similarly with white and buff brick.

Two large light wells furnish ample lighting for the auditorium as well as for the lateral halls.

The exterior windows in all rooms are of the sash balance type. They may be reversed for washing. When pulled shut, weather strips are formed by the adjusters.

The equipment of the building has been specifically planned to meet very definite needs. Furniture was made to order and is of a most modern and permanent type. The color scheme of the entire building trim and furniture is of dark golden oak.

The building was planned late in the fall of 1919 and bids for it were opened January 15, 1920. It was completed and turned over to the board of education in October, 1921. The cost was as follows:

General contract, \$350,300.

Plumbing, heating and ventilation, \$55,854.

Professional fees, \$17,440.

Conduit and connections, \$875.

Boiler house, tunnel and addition to heating plant, \$29,584.

Furniture and equipment, \$46,070.

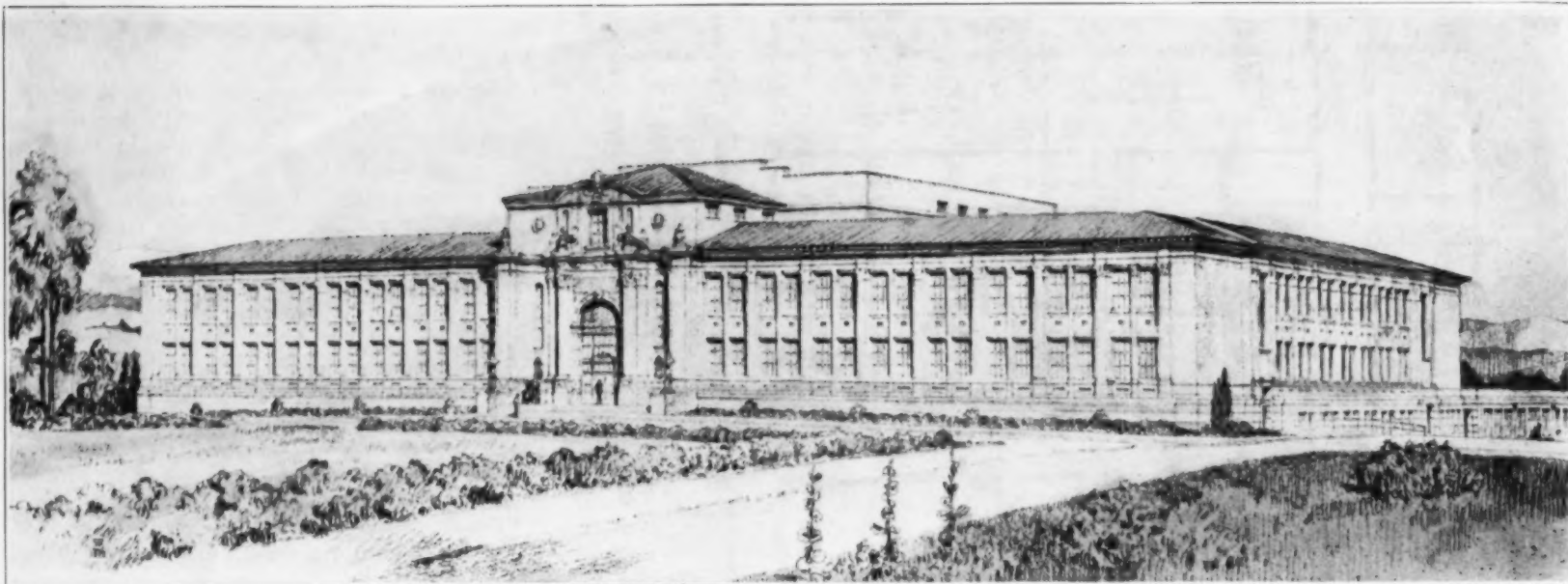
The boiler house and the heating plant serve the high school building, the junior high school building which adjoins, and a third building used as an open-air school.

AN EXPERIMENT IN MARKING. H. C. Daley.

With the co-operation of 33 seniors, all of whom were from the half of the class rated as the better students in the high school at Highland Park, Michigan, William Prakken, the principal, performed an interesting educational experiment last semester.

These students were carefully selected by means of an intelligence test, teachers' estimate of ability, and scholarship record. They were invited to raise the level of their possible failure mark from "5", the general school failure mark, to a "4" or a "3" according to what seemed reasonable to themselves, their parents and their teachers. The agreement was considered to be one between the student and himself. The agreement could be abrogated by the student at any time upon notice to the principal. In case of any student falling below the mark set for himself, it was to be left to the student alone as to

(Concluded on Page 138)



THEODORE ROOSEVELT HIGH SCHOOL, OAKLAND, CALIF.

C. W. Dickey, Architect.

The New Oakland Schools

C. W. Dickey, Architect.

The new schools in Oakland, California, being erected under the five million dollar bond issue voted in 1919, are now nearing completion. They were seriously delayed at the start as a depressed market made it impossible to sell the bonds.

In general, the schools are planned on a rather open two-story scheme, made possible by the mild California climate. This has also made possible a certain element of picturesqueness which has been most successful.

The architecture is in the Italian and the Spanish renaissance, which is considered peculiarly suited to California. In general, the walls are of colored cement stucco in warm coral tints with roofs of russet tiles, mingled with purple and red tones. The designs are simple and rely largely on proportion and mass for their effect rather than on ornament. Columns, formal cornices, etc., are conspicuous by their absence. The result has proved highly satisfactory both as to appearance and cost.

The plans for these schools have been worked out in close consultation with the teaching force of the Oakland schools who, acting as committees on the various types of buildings, and the various departments of instruction, have studied, analyzed, and approved all plans and the details of all built-in equipment. All this work has been carried on under the efficient direction of Superintendent Fred M. Hunter.

The citizens of Oakland are now about to be asked to vote bonds to complete these buildings and to erect others, probably to the extent of eight million dollars.

Theodore Roosevelt High School.

The Theodore Roosevelt high school is a cosmopolitan high school containing well developed elements of vocational as well as academic work and accommodating the seventh to twelfth grades inclusive.

It is located on the top of a hill commanding a fine view in all directions. The main building is two stories in height, with a basement under the rear portion where the ground slopes away from the front. In this basement are located the showers, dressing rooms and other accessories for the physical education department as well as cooking classes, mechanical drawing, locker and toilet rooms, bicycle room, and a general receiving and storage department for handling supplies, with a freight elevator to the upper floors.

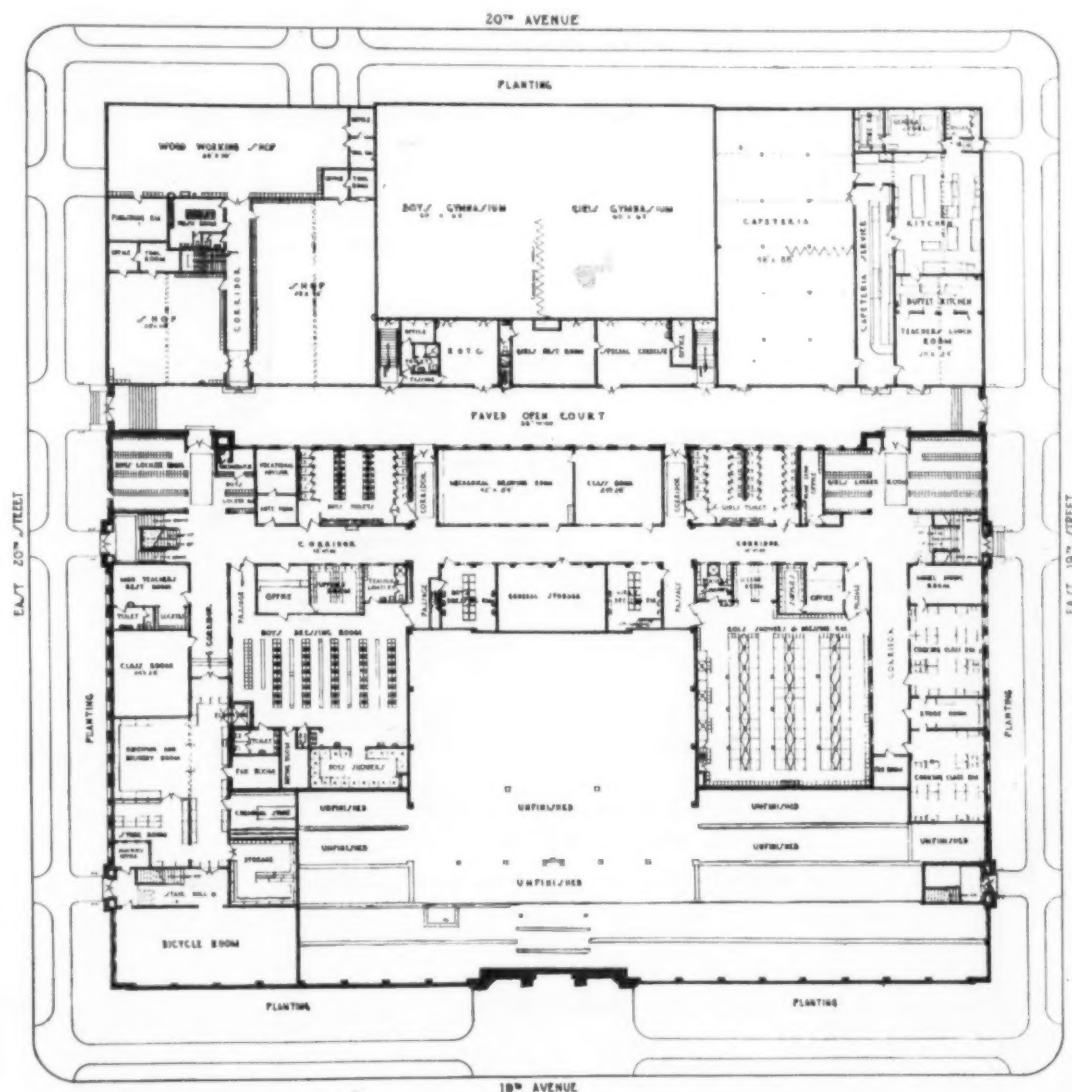
Back of the main building and on the same level as the basement floor and separated from the same by an open court are located the cafeteria, teachers' lunch room, gymnasiums, and shops. In front of the building on the opposite side of the street will be the athletic field.

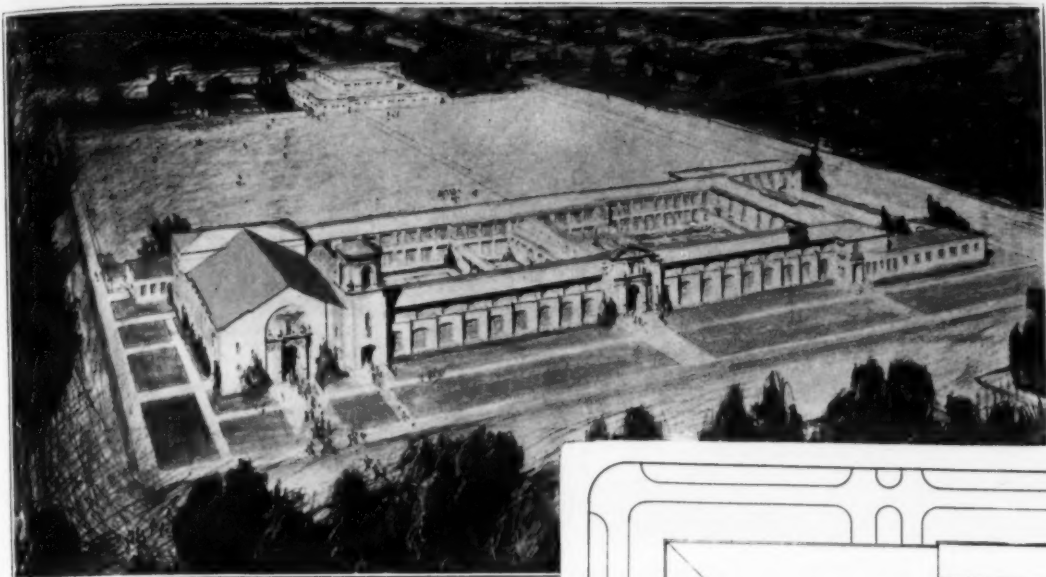
On the first floor of the main building are located the administrative offices and teachers' rooms, the commercial department, a library, study halls, the music department and class-

rooms, besides the auditorium which is opposite the main entrance and is flanked by two large courts.

It will be noted that the circulation and location of stairways are especially good and that the library commands a fine view to the south-east.

On the second floor are located the science department, rooms for sewing, millinery, drawing, applied arts, a lecture room, music rooms

GROUND FLOOR PLAN, THEODORE ROOSEVELT HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect, Oakland, Calif.



UNIVERSITY HIGH SCHOOL, OAKLAND, CALIF.

for individual instruction and general classrooms. A studio drawing room is located on a third floor over the entrance.

The school will comfortably accommodate 1,500 pupils and the auditorium will seat 1,250.

The cost of the building will be about \$800,000.

University High School.

The University High School is essentially an academic high school, accommodating the seventh to twelfth grades inclusive.

It is unique in being a practice school for the Education Department of the University of California, each class being presided over by student teachers as well as the regular faculty. The classes are small—no class has more than twenty pupils—and small offices for the supervising teachers are provided adjoining the classrooms.

A very beautiful and rather unusual feature is the location of the large library, directly opposite the main entrance and between two quiet study courts that are to be appropriately parked. This gives a pleasing impression upon entering the building, as the partition separating the library from the lobby is of glass. It also gives the library a central and beautiful position, thoroughly well lighted, accessible, and yet connecting directly with two study halls, a textbook room, a professional teachers' library room, and the work rooms, office and stock rooms of the library.

The auditorium is placed at one end of the building with entrances from the street as well as from the interior. Back of the stage is located the music department, so that the stage itself can be used for band, orchestra and choral work.

On the first floor the administrative offices adjoin the main entrance on the right and classrooms on the left. An open court at the south end is surrounded by science rooms and shops, with an open-air science garden in the court.

There are four interior courts, and back of these come classrooms, locker and toilet rooms, the cafeteria department and a teachers' lunch room, and a drawing room.

The receiving department for supplies is in a basement, below the cafeteria and kitchen, and is fitted with a lift to the upper floors.

The athletic field will be located in the rear of the building, with gymnasiums for boys and girls at either end of the same.

The ample circulation, stairways, and exterior entrances are to be particularly noted.

On the second floor will be the drawing department, the commercial department, cooking rooms, general classrooms, and the second story portion of the science wing. In this building it will be noted that the school is sheltered from

the noise of the front street by two-story corridors.

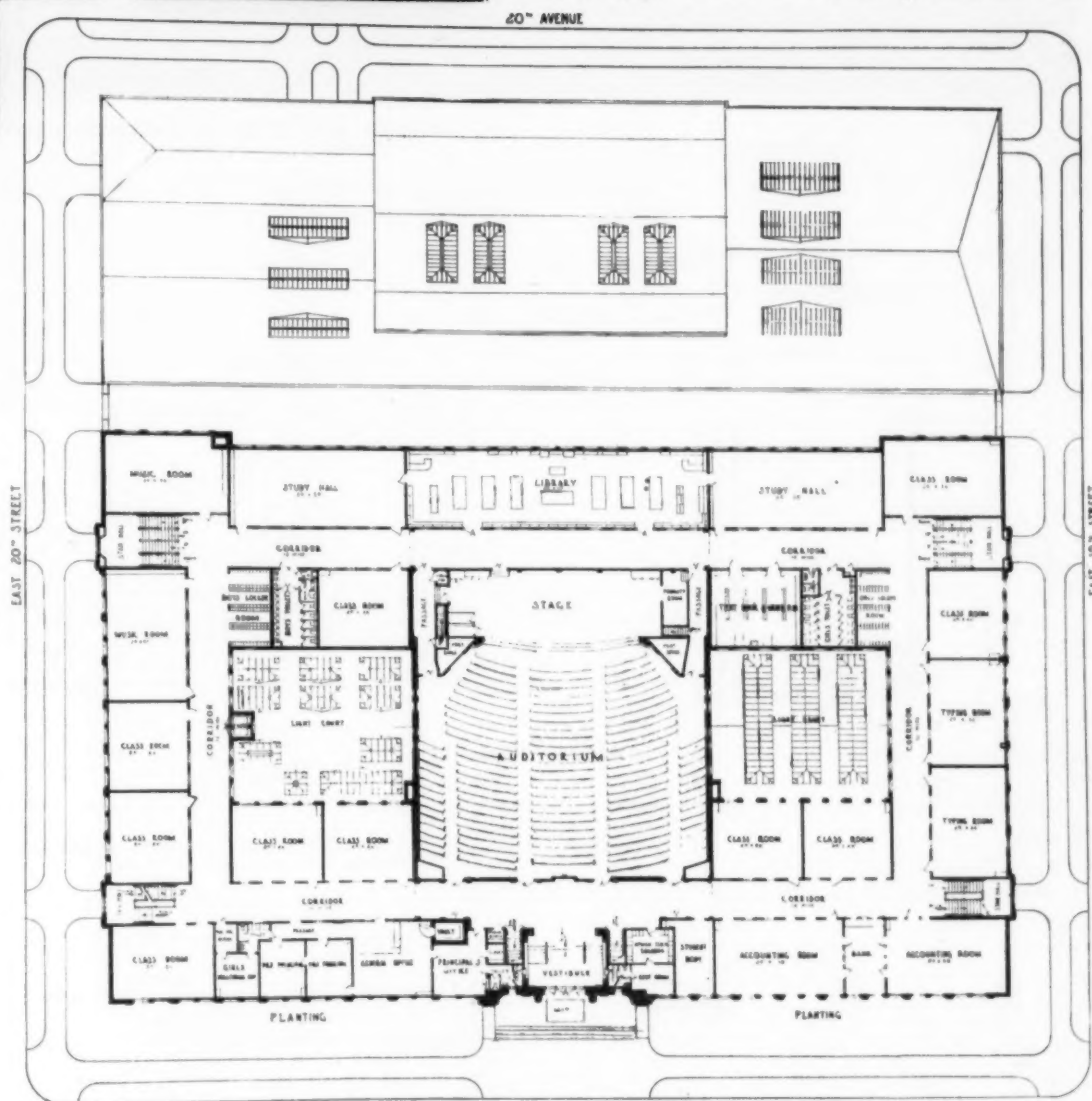
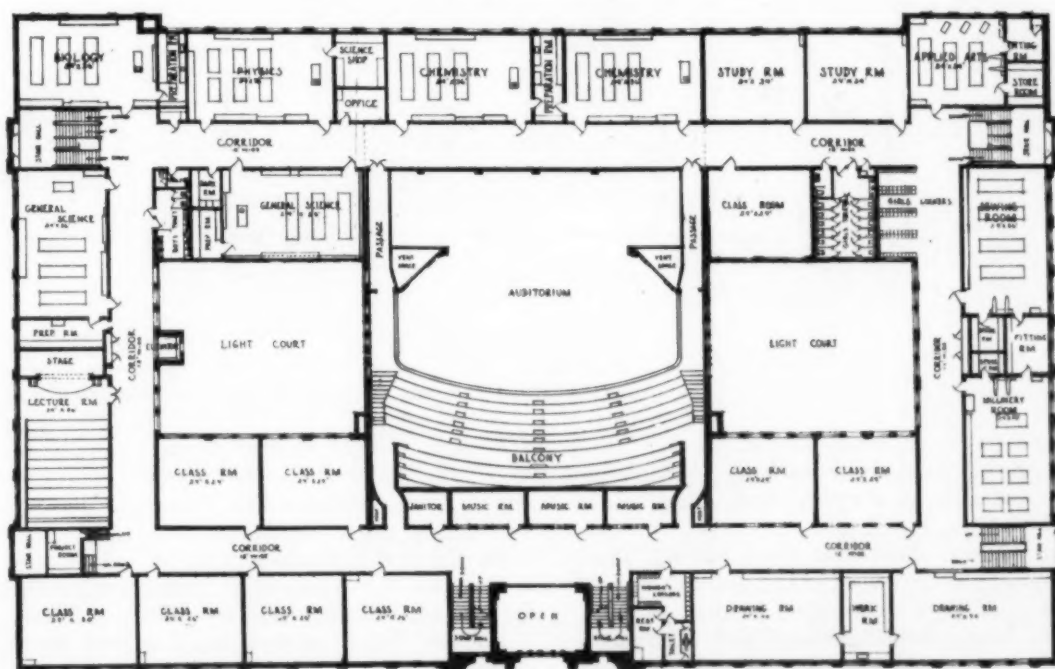
The school will have a capacity of 1,200 pupils and the auditorium will seat 1,250.

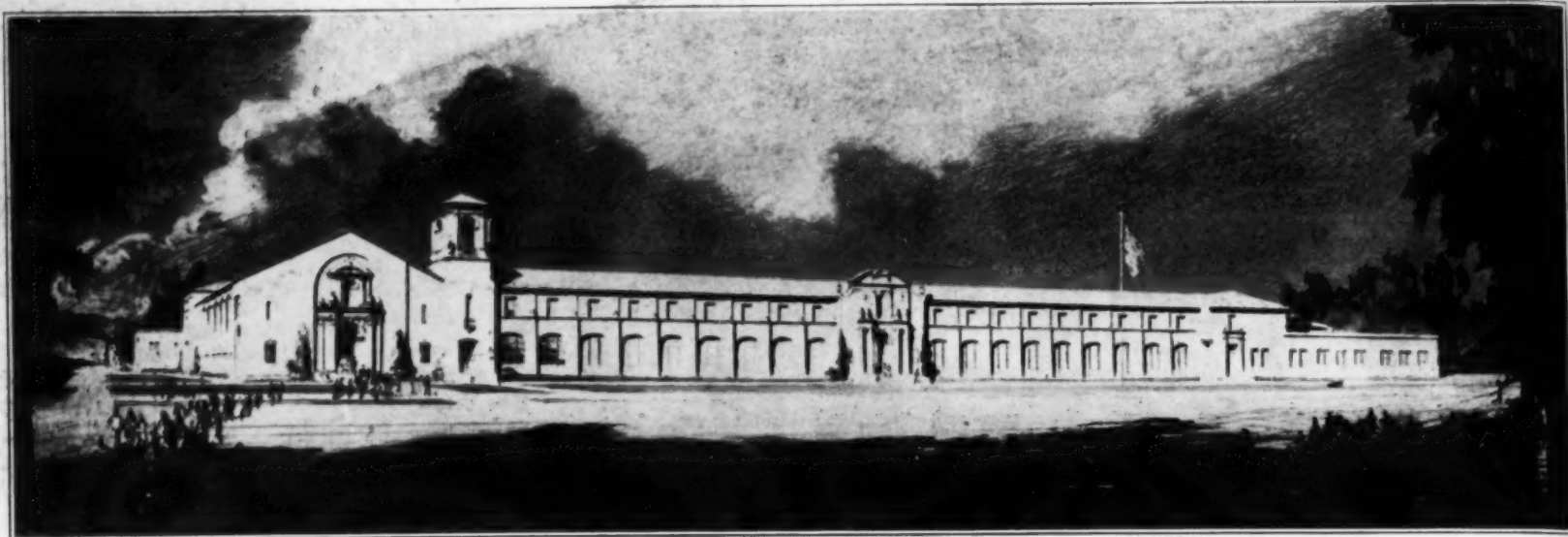
The cost of the building will be about \$550,000.

Elmhurst Junior High School.

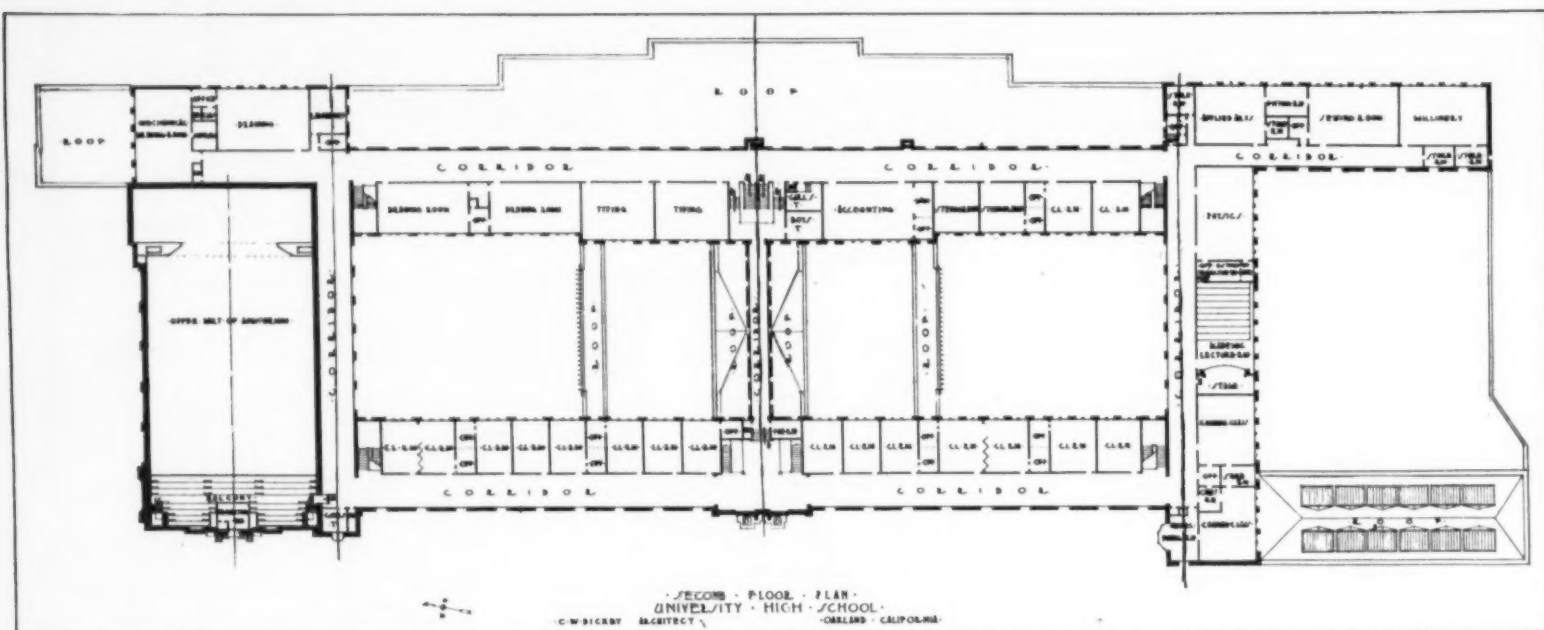
The Elmhurst School is a junior high school. Only one wing of the main building and the front portion of the shop wing are being erected at this time.

Attention is called to the future auditorium opposite the main entrance. It is planned as a combination auditorium and gymnasium. The stage is used as a girls' gymnasium, and

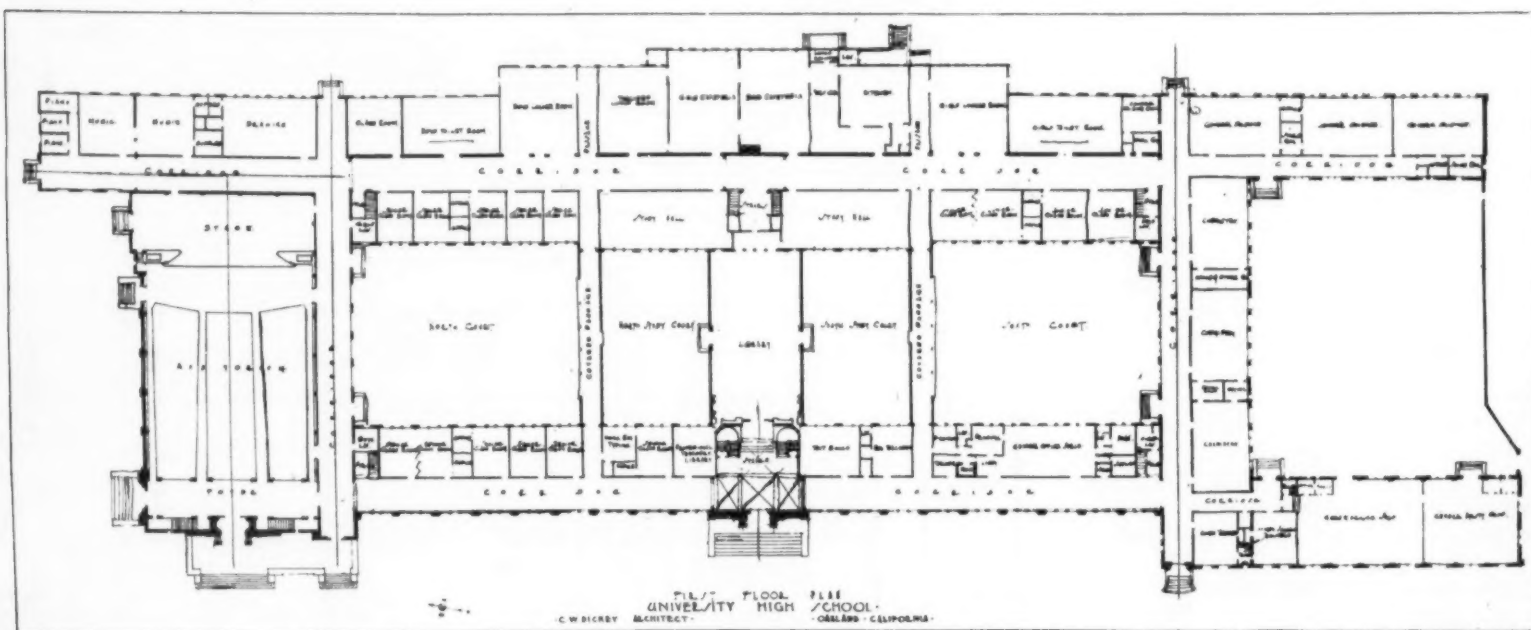
FIRST FLOOR PLAN, THEODORE ROOSEVELT HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect.SECOND FLOOR PLAN, THEODORE ROOSEVELT HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect, Oakland, Calif.



UNIVERSITY HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect.



SECOND FLOOR PLAN, UNIVERSITY HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect, Oakland, Calif.



FIRST FLOOR PLAN, UNIVERSITY HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect, Oakland, Calif.

the portion of the main floor of the auditorium immediately in front of the stage is made level and used as a boys' gymnasium. Back of this level portion, the floor rises toward the main entrance, and there is a large balcony above. There will be 800 fixed seats and 400 movable seats in the boys' gymnasium portion.

The baths, dressing rooms and other accessories are arranged at the sides and rear of the auditorium.

Attention is also called to the arrangement of folding partitions in the cafeteria, shown by dotted lines, whereby this room can be converted into three classrooms.

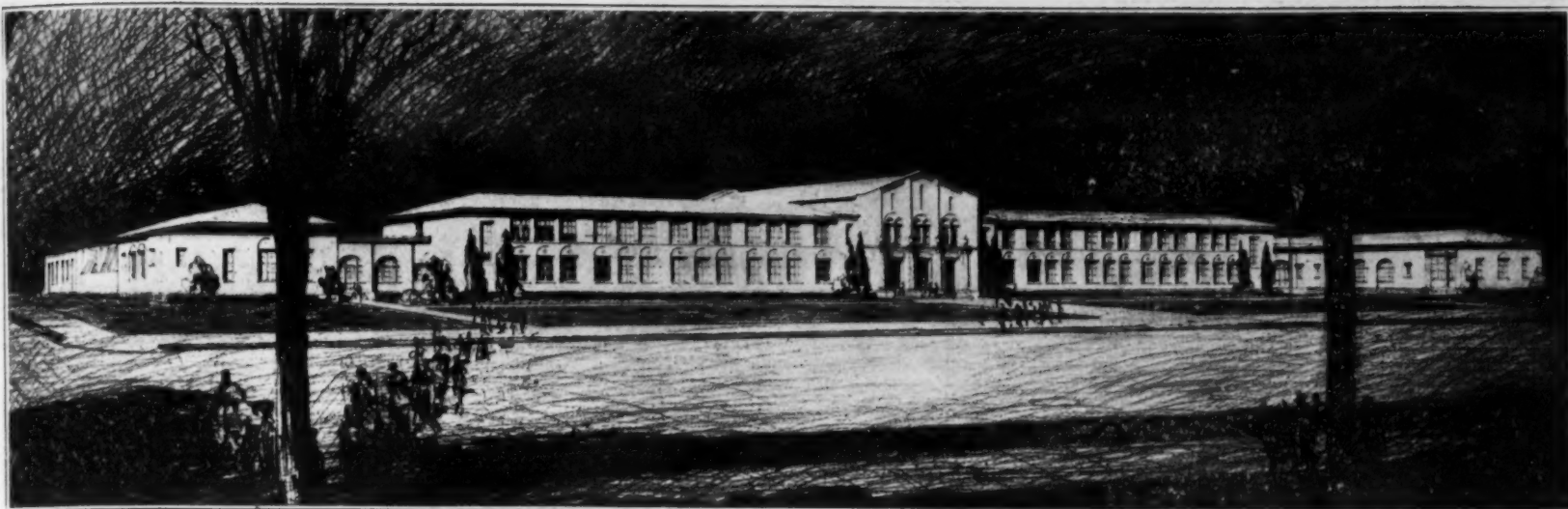
On the first floor are located the administrative offices, the commercial department, rooms for sewing, millinery and cooking, a cafeteria, a teachers' lunch room, a teachers' rest room, classrooms, a lecture room, rooms for drawing, shops, and general toilets and locker rooms.

On the second floor are located the library, the study halls, the science department, and classrooms.

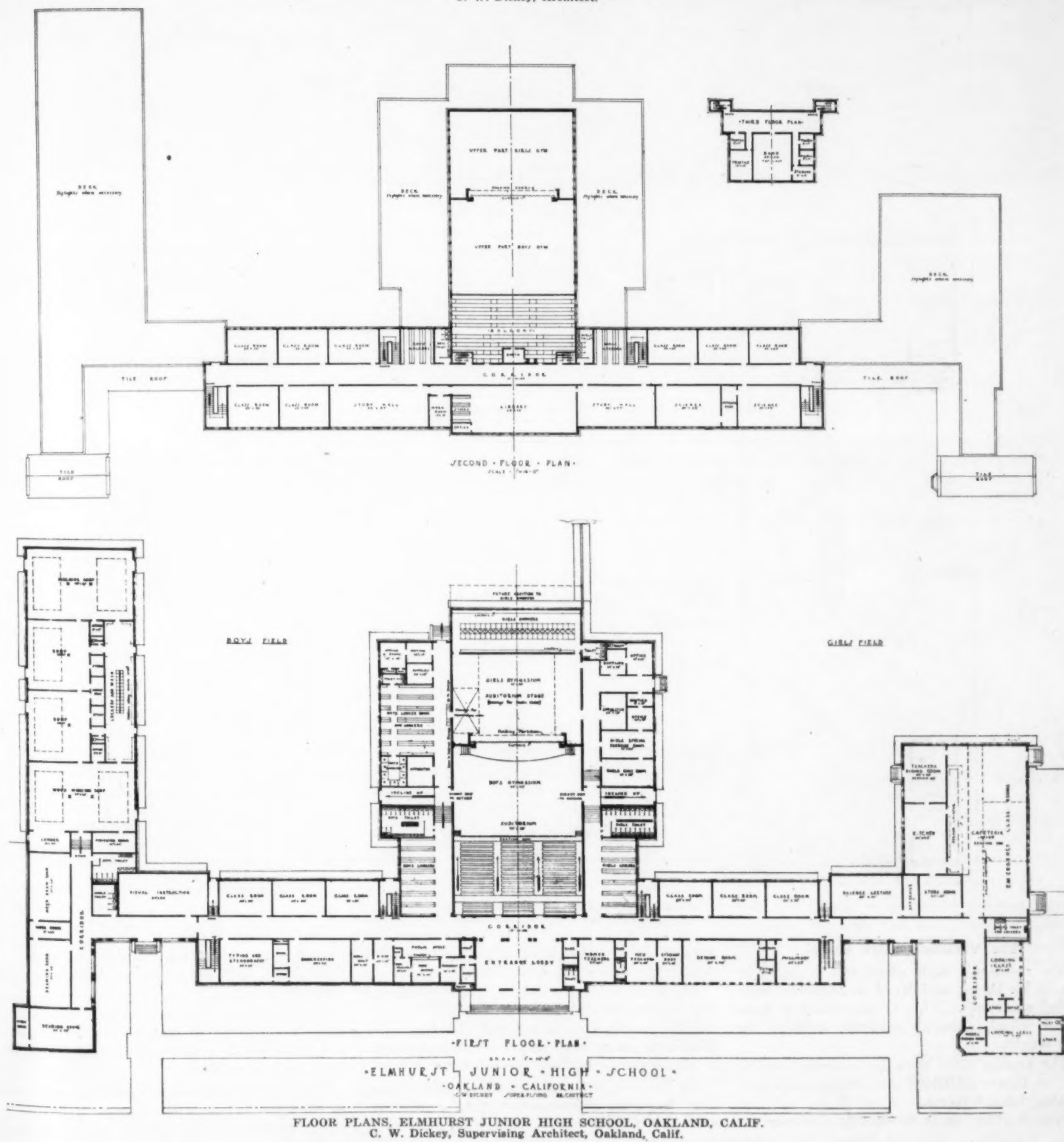
The music department is in a third floor over the entrance.

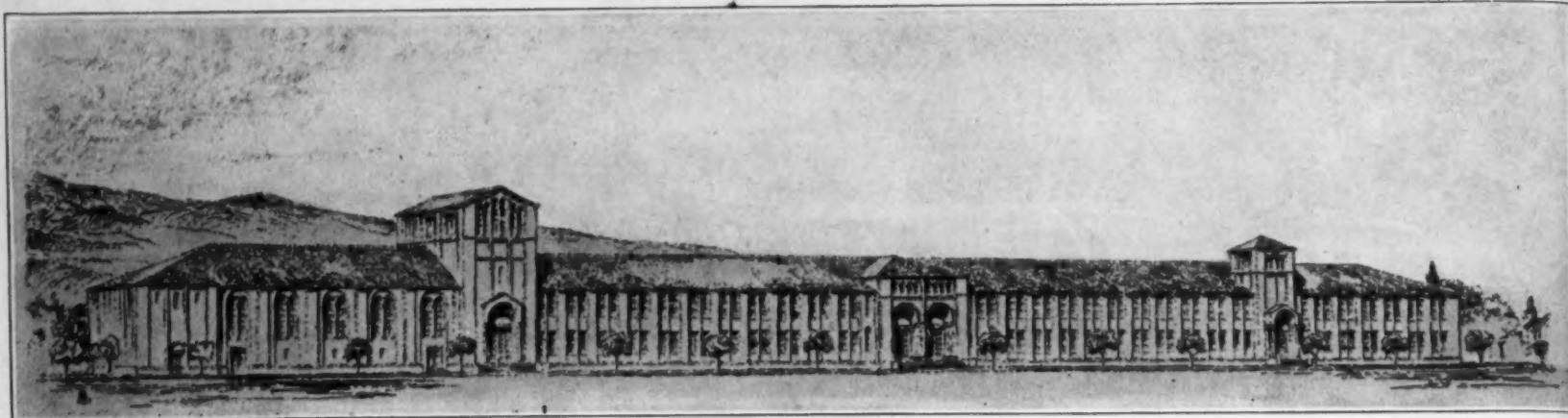
The building when completed will accommodate 1,200. The auditorium will seat 1,200.

The cost will be, when completed, about \$400,000.

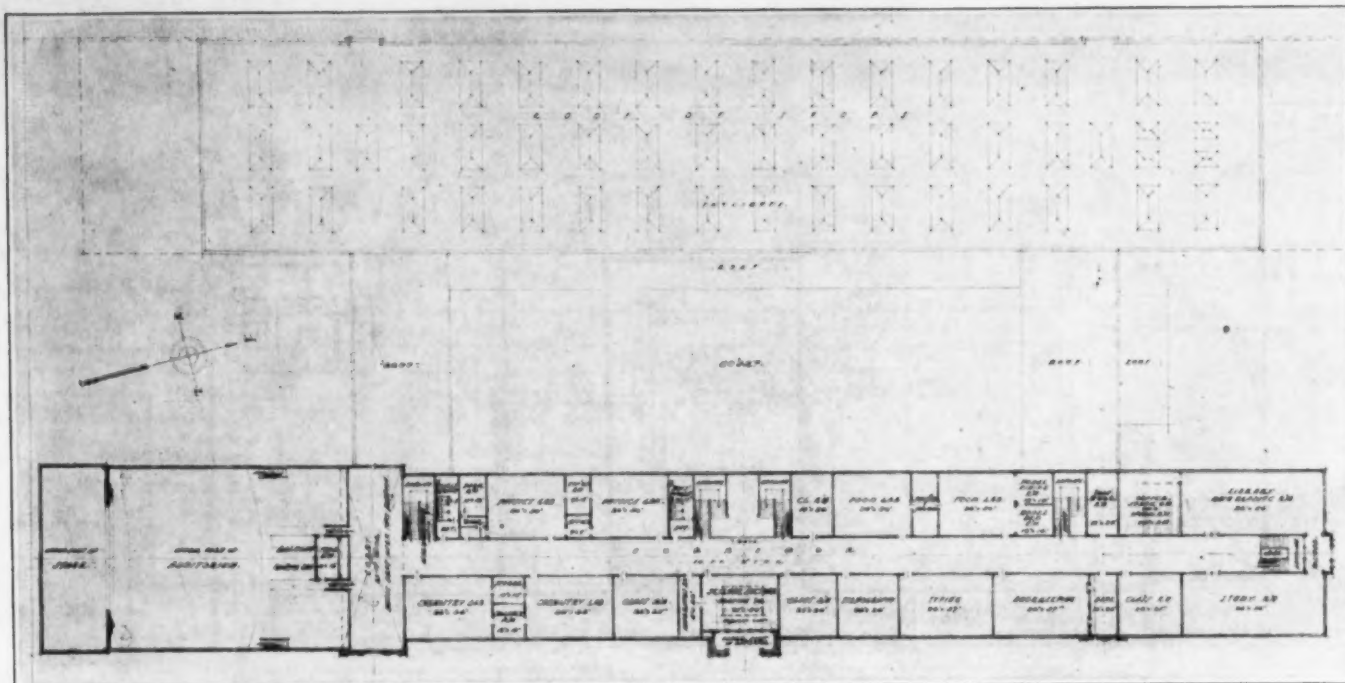


ELMHURST JUNIOR HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect.

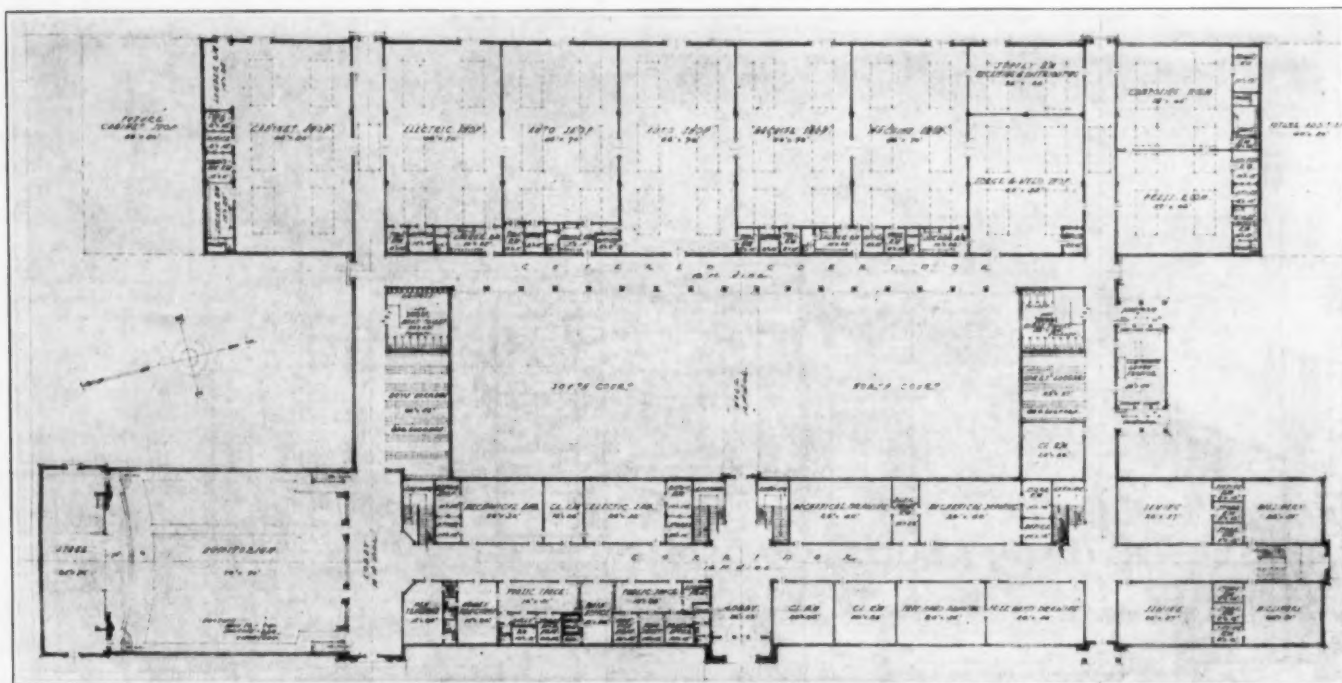




VOCATIONAL HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey and J. J. Donovan, Associated Architects.



SECOND FLOOR PLAN, VOCATIONAL HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey and J. J. Donovan, Associated Architects.



FIRST FLOOR PLAN, VOCATIONAL HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey and J. J. Donovan, Associated Architects.

The Vocational High School.

The vocational high school was designed by Mr. C. W. Dickey and Mr. J. J. Donovan, associated architects. This is essentially a vocational school, although academic subjects are also taught.

The present plans show an incomplete building, as future additions are contemplated containing twenty rooms.

Special attention is directed to the very ex-

tensive shops. This work is carried to a high degree of efficiency in this school.

The future library will be located opposite the front entrance and between two courts as in the University high school and the Alexander Hamilton junior high school. The auditorium is at one end as in those two schools.

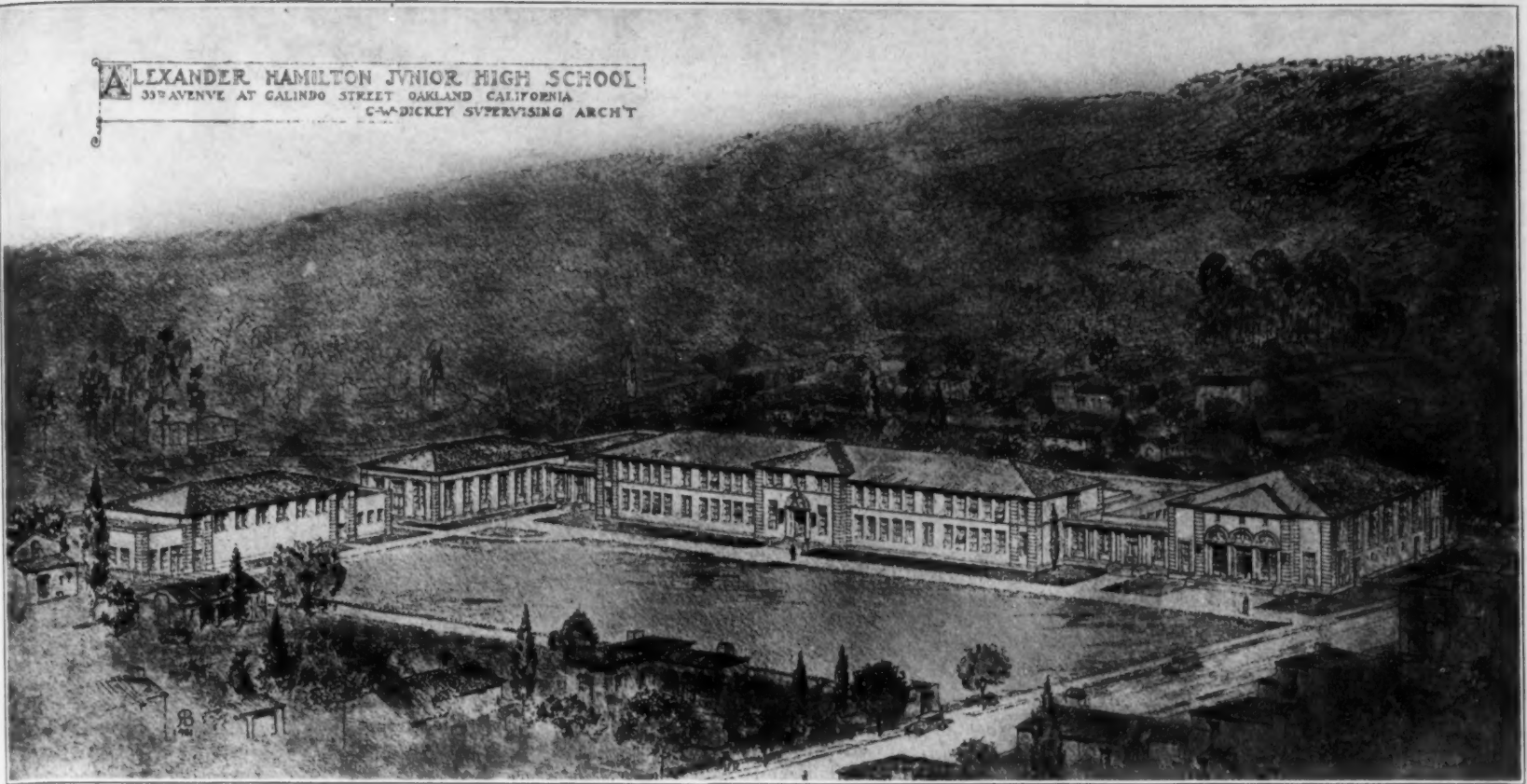
On the first floor are located the administrative offices, the auditorium, rooms for drawing, sewing and millinery, mechanical and electrical

laboratories, classrooms, shops, the painting department, and the receiving department for supplies.

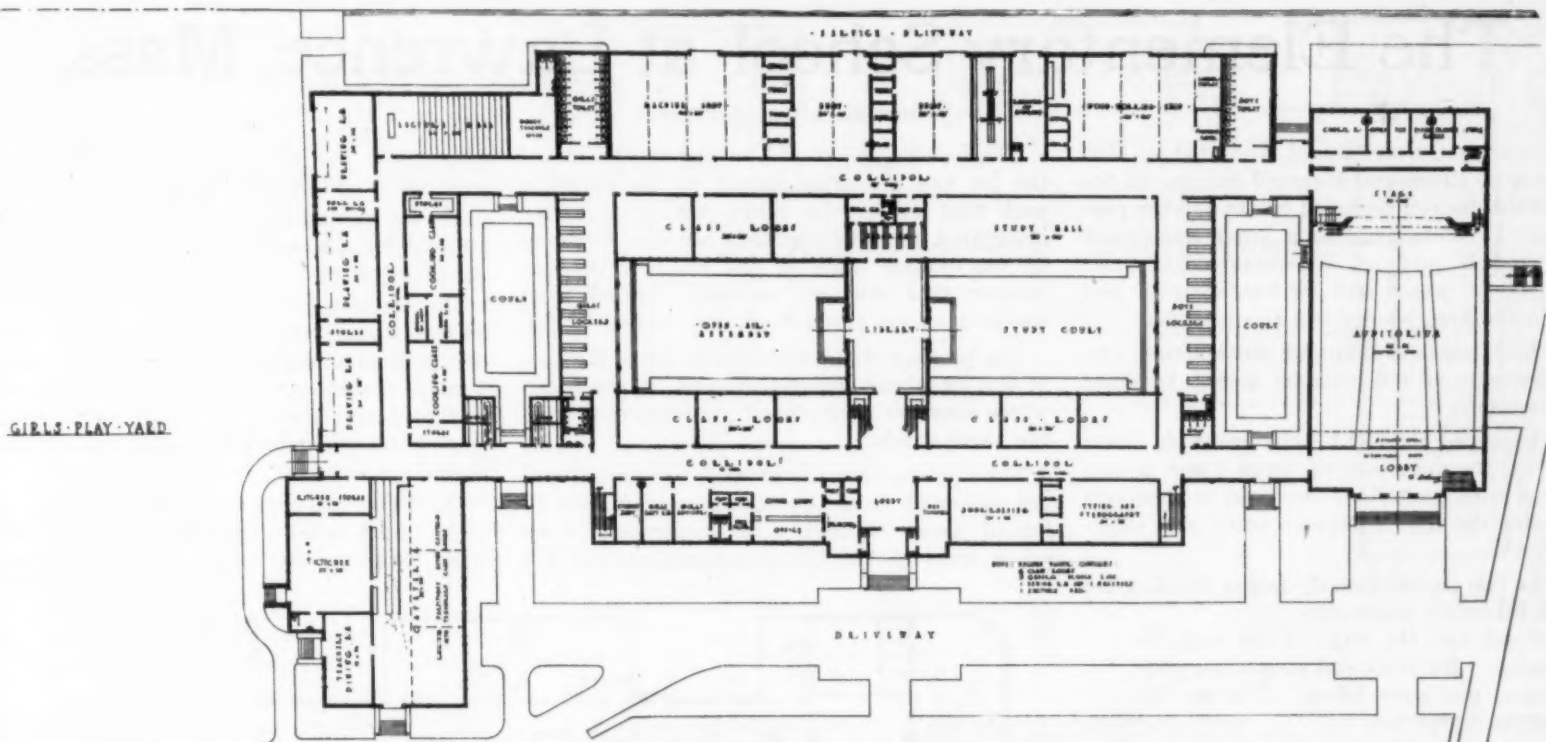
On the second floor are located the science department, the foods department, the commercial department, a temporary library, a study room, and classrooms.

The athletic field and gymnasium are located on the opposite side of the street.

The portion of this school now being con-



ALEXANDER HAMILTON JUNIOR HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Supervising Architect.



GROUND FLOOR PLAN, ALEXANDER HAMILTON JUNIOR HIGH SCHOOL, OAKLAND, CALIF.
C. W. Dickey, Architect, Oakland.

The gymnasium building adjacent to the domestic arts department is not shown in this cut.

structed, as shown by the accompanying plans, will accommodate 1,000 pupils; and when completed, the school will accommodate 1,500 pupils. The auditorium will seat 1,200.

The cost of the portion of this building now being constructed will be about \$450,000.

Alexander Hamilton Junior High School.

The Alexander Hamilton School is a junior high school. The auditorium and gymnasium are not being built at this time.

In examining the plans it will be noticed that the library is located opposite the main entrance and visible through a glass partition. Like the library in the University high school, it is flanked by two study courts which will be beautifully parked.

The main front portion of the building is two stories high but all other portions are one story.

In the main two-story building are located the administrative offices, the commercial de-

partment, the science department, sewing and classrooms.

In the rear wing are located the shops, a study hall, the main toilets and locker rooms and classrooms.

ALL MEN CREATED EQUAL.

According to the dictum of Thomas Jefferson, as expressed in that grand old document of American liberty, the Declaration of Independence, "all men are created equal." It is a superb declaration of human rights, but in an age of science like the present, when everything physical and psychical is subjected to rigid analysis, we have to take the immortal sentence of the great statesman with a pinch of salt. From a scientific standpoint, all men are not created equal, either in body, mind, or estate. Inequality is the law of nature. But what Jefferson evidently had in mind was "equality of opportunity," which is the very bedrock of democracy. If "equality of opportunity" be the basis of democracy, then it applies with peculiar pertinency to education, higher as well as elementary.—H. R. Evans in School Life.

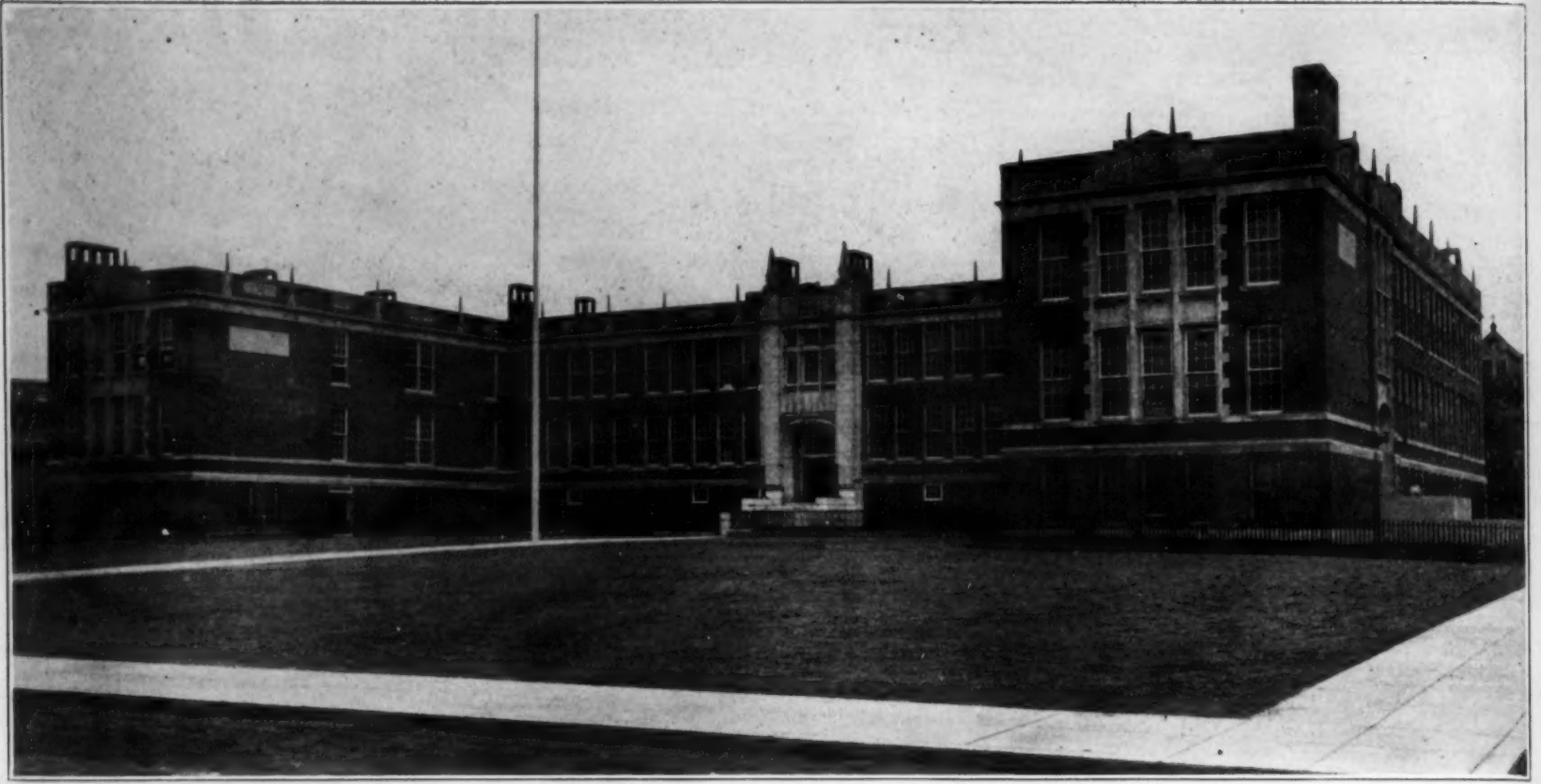
In the west wing are located the lecture room, the drawing room, the cooking room and the cafeteria. Attention is called to the arrangement in cafeteria, shown by dotted lines, whereby this room can be converted into three classrooms by the use of folding partitions.

The auditorium is located to the east, with entrances both from the school and from the street, and with a music department adjoining the stage.

The gymnasiums are in a separate building located between the boys' and girls' athletic fields.

This school will accommodate 1,200 pupils and the auditorium will seat 1,250.

The cost of the portion that is now being constructed will be \$225,000, and it will cost \$200,000 additional to complete the plant.



ELEMENTARY SCHOOL, LAWRENCE, MASS. James E. Allen, Architect.

The Elementary School at Lawrence, Mass.

James E. Allen, Architect.

The new elementary school is located on Erving Avenue, Bruce and Harvard Streets, on the edge of the district occupied by the foreign population. It is designed as a lower elementary school and is intended to accommodate 1,058 pupils, 50 of which will be kindergarten and 1,008 in the first, second and third grades.

The building is of fireproof construction, and its exterior is of red common bricks, trimmed with limestone.

The panels of the blank walls are made interesting by the insertion of large stone panels inscribed with quotations intended to inculcate and foster the true American spirit and sentiment.

On the two panels directly facing the flagpole are the following quotations:

I am not the flag. I am only its shadow. My stars and stripes are your dreams and your labors. You are the makers of the flag.

I pledge allegiance to my flag and to the republic for which it stands, one nation, indivisible with liberty and justice for all.

And on the other panels the inscriptions are as follows:

God hath made of one blood all nations of men and we are His children, brothers and sisters all.

I am an American. To be an American is to love America, to believe in America and to serve America.

God grants liberty to those who love it and are always ready to defend it.

*America! America! God shed His grace on thee,
And crown thy good with brotherhood
From sea to shining sea.*

The building is placed on the north side of the lot and the arrangement of the rooms is such that all of the classrooms are properly orientated, and the corridors are also arranged in the outside walls of the building in such manner that they are perfectly lighted from windows almost throughout their entire length.

The placing of the building on the north side of the lot places the playgrounds to the south where they are well sunned and protected from the north winds.

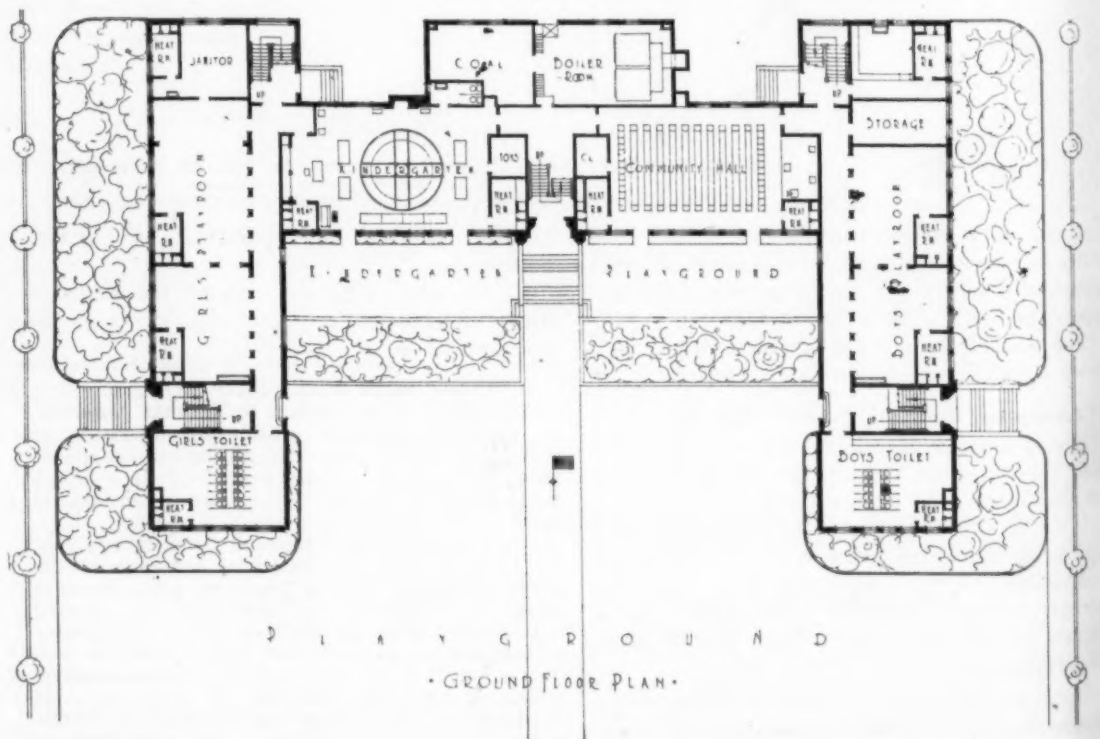
The kindergarten playgrounds are sunken and are separated from the general playgrounds by fenced areas planted with evergreens. Such other areas of the lot as are not utilized for

play space are also fenced and planted with evergreens and deciduous shrubs.

On the ground floor is a small hall which may be used for community gatherings as well as for school purposes.

On the first and second floors are located the 24 classrooms. On each of these floors are also arranged toilet rooms for the teachers and also a small percentage of the toilets for the pupils so that during session the pupils are not obliged to go to the ground floor where the general toilet rooms are located.

On the second floor a generous teachers' room, with ample toilet and locker facilities and a small kitchen, has been provided. Directly



GROUND FLOOR PLAN, NEW ELEMENTARY SCHOOL, LAWRENCE, MASS. James E. Allen, Architect.

across the corridor is located the clinic which is an important feature of the building. This room is tiled in glazed white tile and is fully equipped with complete dental and optical apparatus, scales, first aid cabinets, etc., and with an attendant's desk and filing cabinets for the keeping of records.

Another feature of this building is the kindergarten, with its direct connected evergreen hedged sunken playground, its great fireplace and generous closet for the storage of playthings. The decorations of this room are ingeniously designed and arranged from stock wall papers and are a joy to the hearts of the kiddies. The decorations consist of a colorful spring scene background, skirting a log fence in front of which are arranged the familiar nursery rhymes and pictures and various playtime and circus scenes.

The building is economical of cube, containing but 550 cubic feet per pupil. It cost, including grading, planting and equipment, \$283 per pupil.

Its total cost was \$300,433 and it was built for the original contract price without any extra work whatever.

TARDIES AT TILESTON.

Principal J. C. Seegers, Wilmington, N. C.

At the beginning of the 1921-1922 school term, the school faced the necessity of nearly complete reorganization. The district lines had been changed, the school had been moved into a new building, the teaching force had suffered considerable change from the past year, and a new principal had been appointed. Naturally, under such conditions, there was little school spirit or morale manifest in the children, and the most discouraging phase of that lack of morale was in the utterly careless attitude of the children toward the attendance and punctuality record of the school, especially in regard to the latter. The enrollment of the school during September, 1921, was over 900, and the school reported 264 tardies for that month. The laxness manifested there communicated itself to other departments of work, and there seemed the logical place to commence. The steps taken were these:

First, at a number of assembly exercises, the principal spoke of school pride. Fortunately, some of the other schools of the system furnished excellent examples. During the course of the year the school won a number of prize contests, and practically every athletic contest entered. This success was capitalized, but while the tardy record remained unsatisfactory, the principal reminded the children that other schools remarked, "Well, you won the game, but we beat your tardy record, and we always will."

This was literally true, and the children knew it. It was not long before they began to respond. At every sign of improvement, they were notified and congratulated.

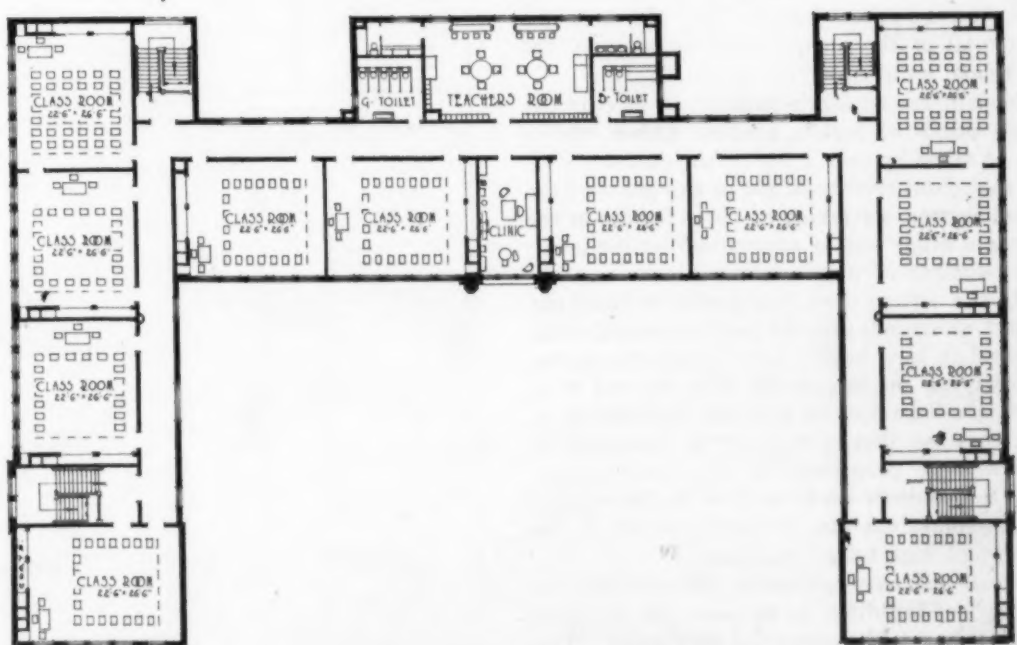
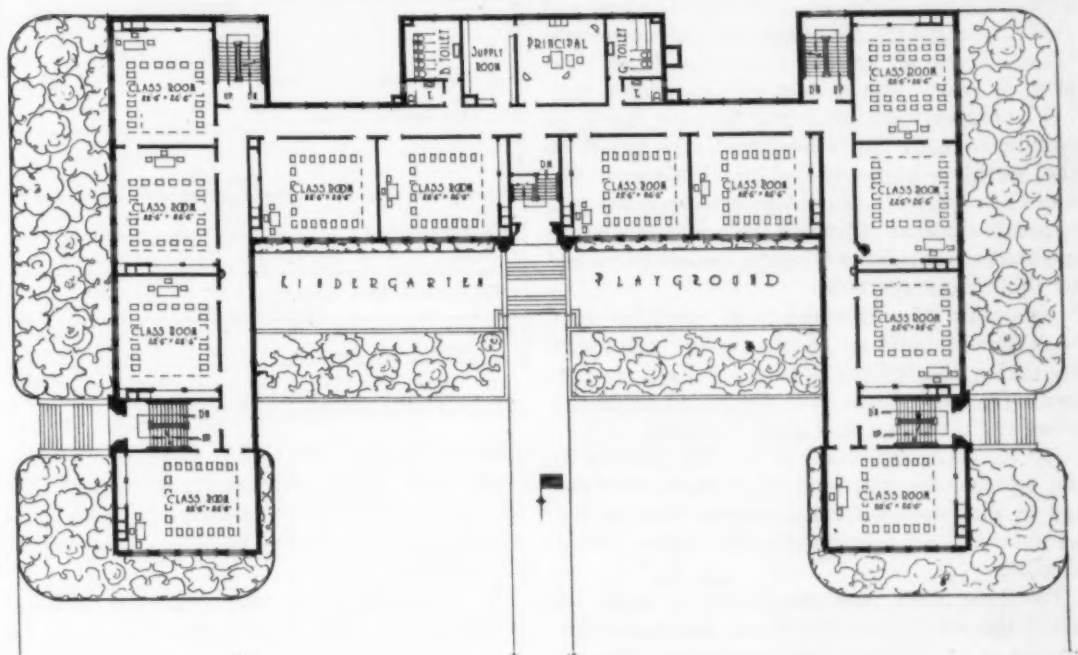
Second, each room was given a flag to place over its door. As long as the room's attendance record was satisfactory, and it had no tardies, that flag flew. If it was retained for a week the room was allowed to dismiss slightly earlier on Friday. If the flag was retained for four weeks, a larger flag was given it, and after four more a still larger one, and so on. The rooms which had retained the flags for a week brought them to the chapel exercises on Friday, and displayed them on the rostrum during the salute to the flag.

Third, each patron of the school was sent a letter, by the principal, through the children, and was asked to help. If parents seemed apathetic the teachers visited them, and put the case squarely before them. The topic was presented also at two meetings of the parent-teacher association, and each improvement was

(Continued on Page 429)



THE KINDERGARTEN, ELEMENTARY SCHOOL, LAWRENCE, MASS.
James E. Allen, Architect, Lawrence, Mass.



PLANS, NEW ELEMENTARY SCHOOL, LAWRENCE, MASS.
James E. Allen, Architect, Lawrence, Mass.

Evolution of a High School Plan

A. F. Hussander, Architect, Chicago, Ill.

The foundation and supporting walls must be built before the roof can be put on a building.

In planning a high school building it is necessary to lay the foundations for the requirements in the way of use and occupation of the building before proceeding with the plan for the building.

Some years ago the National Education Association appointed a committee on the standardization of school building planning and construction. This committee carried on an investigation of school building plans from different parts of the country and analyzed the various features and requirements. From the results obtained, the committee has adopted a chart showing the standard percentage of floor area which various portions of a school building should have in relation to the total square foot area of the floors of the building.

It surprises a great many people to learn that this chart shows that, in a school building which is primarily designed for instruction, the normal percentage of space occupied for strictly instructional activities is only 50 per cent of the total floor area of the building.

The findings of the committee have been a great aid in checking up plans to see that proper provisions are made for instructional space and that waste spaces are eliminated wherever possible. There are types of school buildings, however, to which this system of percentages cannot be properly applied. For instance, one-room country schools and school buildings in which the corridors are restricted or eliminated, also buildings where the corridors are expanded into a gymnasium or assembly hall and the space credited as instructional space, cannot be judged by this percentage rule.

The unit of accommodations required in a high school building is the individual pupil. By taking the individual pupil and his requirements for space in which to study and recite the necessary academic and shop branches and to carry on other activities, it will be possible to add together the sum total of all pupil activities and in that way to form a concrete idea of the accommodations required for the entire school building.

To these first pupil-requirements must be added the administrative offices, the rooms for heating and ventilation, the accessories, the corridors, stairs, walls and partitions, and the other constructional features that will make the sum total of the square foot area required for the school building.

Some of the academic studies will be required of all pupils of certain grades. Other studies will be taken by only a few of the students during each year, or only in one or two years of the school course. By taking up these factors in the course of study and by approximating the maximum number of pupils that will take any one study at a certain time, it is possible to figure out a chart which will give the total accommodations required in each branch and in each classroom. By carrying on this study with the aid of a chart it will be possible to so fix the number of classrooms so that it will not be necessary to have a large proportion of classrooms empty, while the students are at work in the laboratory, shops, gymnasium, etc., as usually occurs in the old type of high school buildings.

One of the most expensive arrangements in high school buildings is to have two or more fixed stations, or locations, for each pupil. The waste results when rooms are provided with

PRELIMINARY CHART OF FLOOR AREA FOR HIGH SCHOOL PLANS

INSTRUCTION SPACE (50% OF TOTAL AREA REQUIRED)	OTHER SPACE (50% OF TOTAL AREA REQUIRED)
Sq. Ft.	Sq. Ft.
12 CLASS ROOMS 7200	STAIRS, CORRIDORS ETC. (20%) 12,250
2 RECEPTION ROOMS 600	
3 COMMERCIAL ROOMS 1500	
2 LABORATORIES 1800	
2 DRAWING ROOMS 1400	
2 HOME ECONOMICS 1200	
1 WOOD WORKING SHOP 1200	
1 LIBRARY 600	WALLS AND PARTITIONS (10%) 6140
1 ASSEMBLY HALL (INCLUDING STAGE) 7500	
	ADMINISTRATION (10%) 9624
1 GYMNASIUM (INCLUDING DRESSING AND SHOWER ROOMS) 7500	
	ACCESSORIES (3%) 1642
	FLOORS (1%) 614
TOTAL INSTRUCTION SPACE 30,700 SQ. FT.	TOTAL OTHER SPACE 30,700 SQ. FT.
TOTAL FLOOR AREA REQUIRED FOR ENTIRE BUILDING 61,400 SQ. FT.	
(ASSUMING AN AVERAGE HEIGHT OF 17 FEET TIMES FLOOR AREA)	
TOTAL CUBIC CONTENTS - 1,043,800 CU. FT.	

CHART FOR DETERMINING AREA OF HIGH SCHOOL BUILDING.

desks which are individually assigned to certain pupils and the respective desks are vacant all of the time that the pupils assigned to them are in another portion of the building, e. g., in the laboratories.

It is considered by some educators to be an advantage to have a separate desk for each

pupil, but this is an expensive arrangement in so far as building construction and equipment are concerned.

Selection of Site.

The selection of the site for a new high school building is often very troublesome. It requires considerable study and analysis of community conditions and probable future trends in population, business, etc., to recommend the most desirable site.

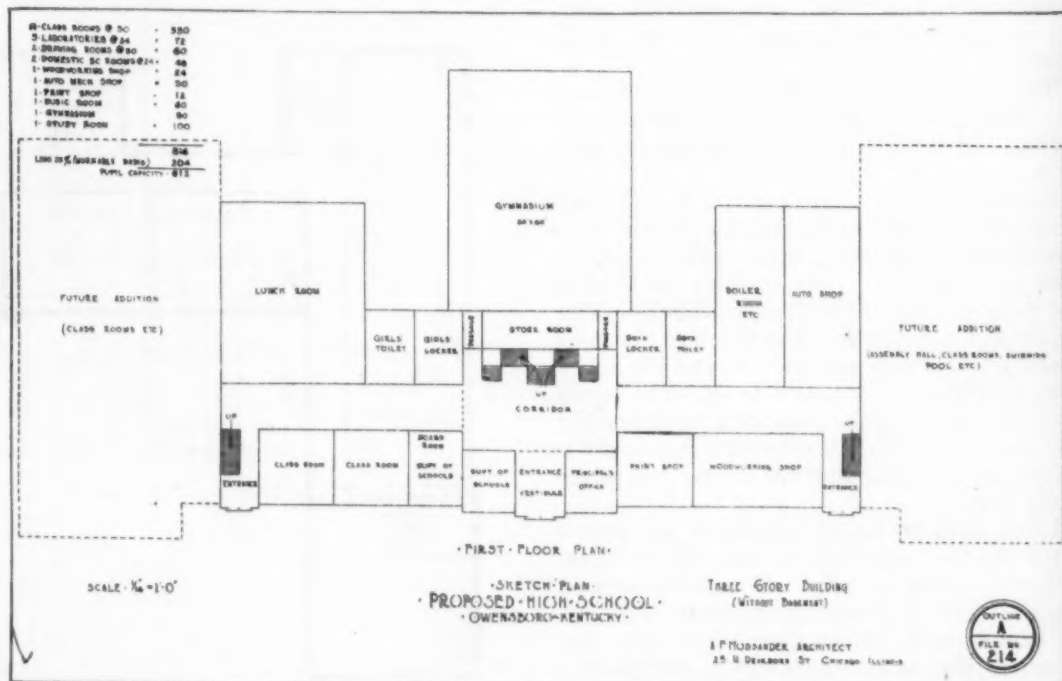
One of the methods of analyzing the present locations of schools and the school population is to take a large scale map of the city or school district and to designate the schools and the pupils in the blocks in which they live, either by a pin or dot. Then by drawing straight lines from the residences to the schools which the pupils attend, it will soon become apparent where the greatest number of pupils are living and the distance which they must travel to school. This study can be carried still further by making separate maps for each grade, so as to show the distribution of pupils in the different grades separately.

This set of charts will give a definite idea of the location of pupils and will constitute a clear picture of present-day conditions, but in order to anticipate future growth and probable changes in conditions, it is necessary to take into consideration a great many other factors.

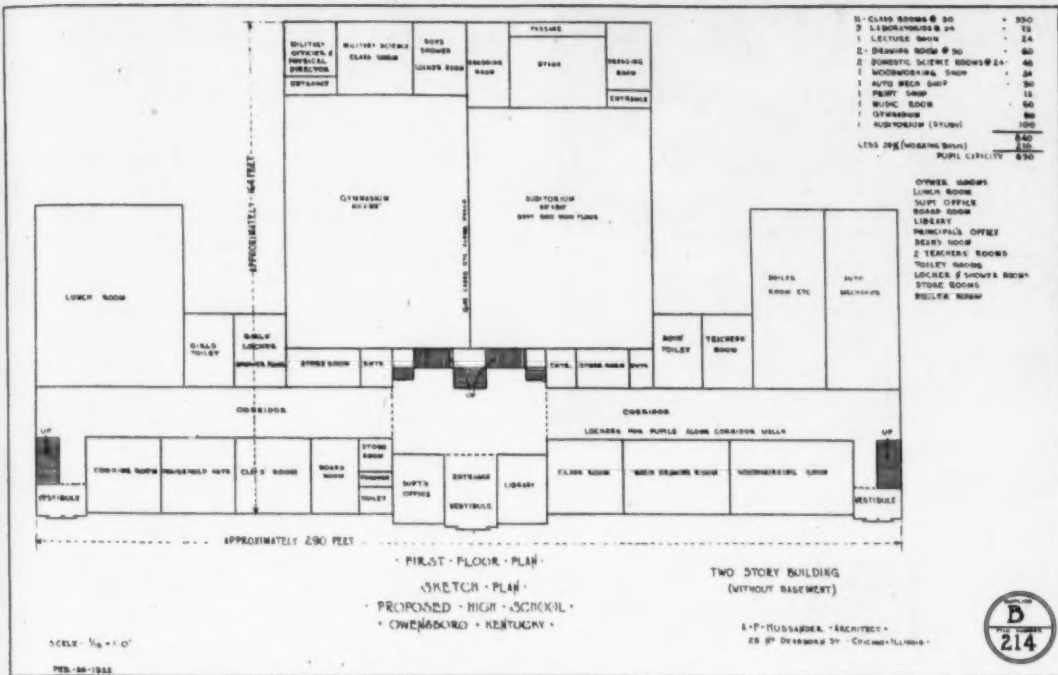
School buildings should be kept away as much as possible from business sections, factory districts and railroad yards and terminals; and particular attention should be given in every study of school sites to probable growth and expansion of the business section of the school district.

The extension of residential sections can often be approximated by consulting with and obtaining data from the local telephone, water and lighting companies, as most public service corporations nowadays give particular attention to the study and analysis of future trends of population and business.

After the general location for a new school-house is settled, it is essential that the most desirable feature of a school site—its ample size—be determined. Ample size of a site involves not only provision for the present building and playgrounds, but also implies future additions



SCHEME A FOR OWENSBORO HIGH SCHOOL.



SCHEME B FOR OWENSBORO HIGH SCHOOL.

or additional buildings if required, and thus seeks to avoid the expensive necessity of purchasing adjoining improved property at some future time.

It is, therefore, generally well to locate a school building well away from the center of thickly populated portions of the district and toward the vacant property where the prospective future homes will be built.

Of course, there are extremes both ways, and it is undesirable to go so far from the center of population as to be entirely outside of the radius of walking distance for pupils of the present day. However, the general tendency is much the other way, and the mistake of placing buildings for the present needs without due consideration of the future shifting of population is most common.

The modern tendency is toward large playgrounds and athletic fields in connection with school buildings, so that ample facilities can be given for active outdoor exercise which is so much needed by the children to develop them physically as well as mentally.

High School Capacity.

Elementary schools are easily classified by the number of classrooms which they contain and the pupil capacity can be easily figured.

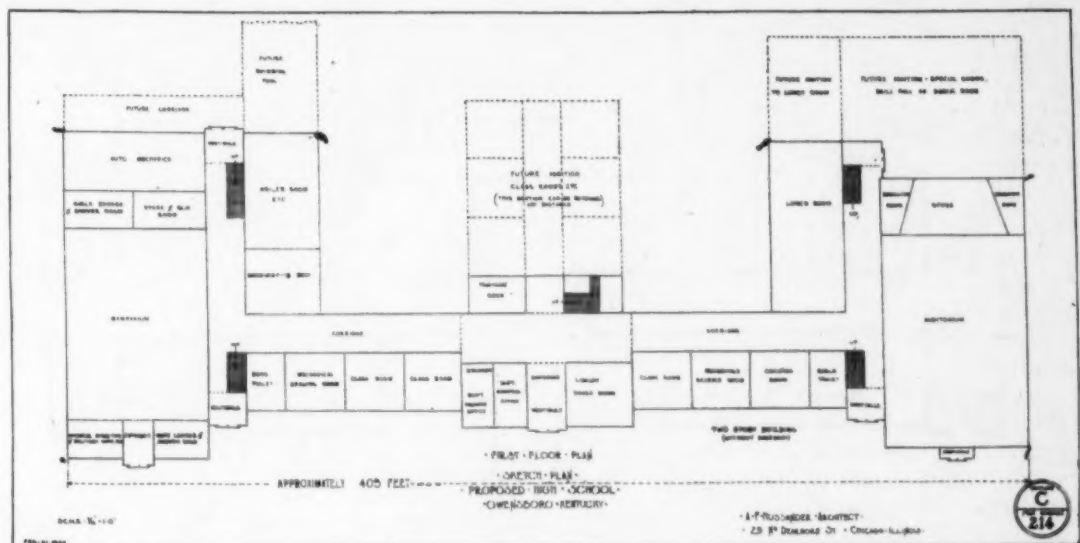
Before an intelligent idea of the capacity of a high school building can be formed, an analysis

must be made of what rooms are required to accommodate the students in the various courses to be given under the courses of study.

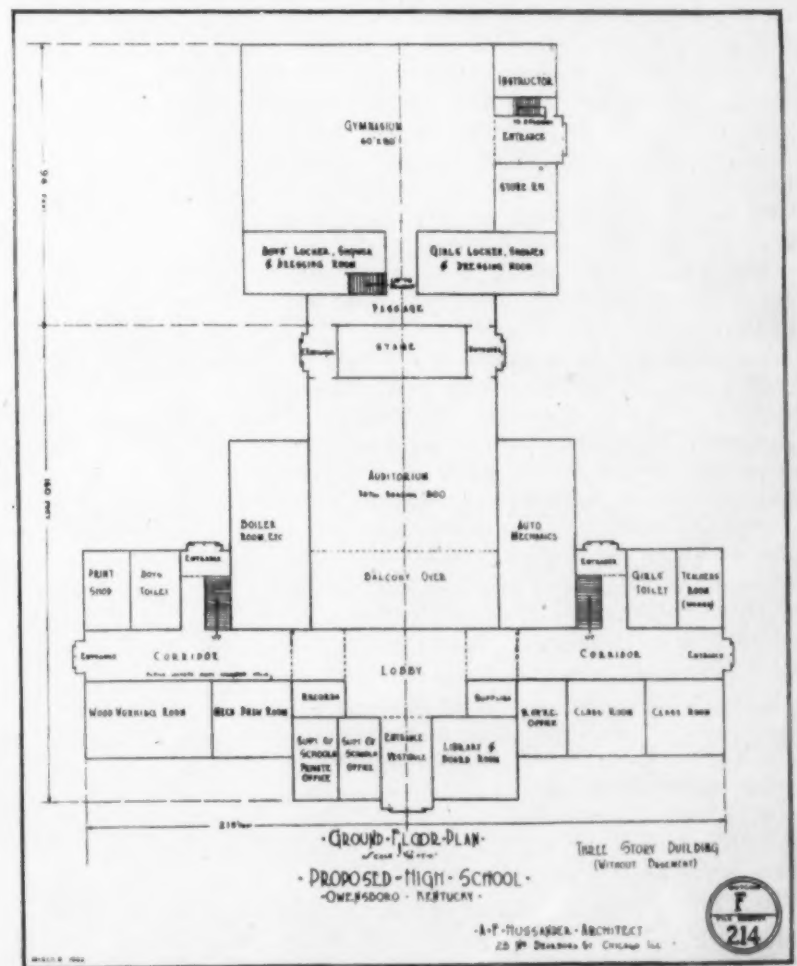
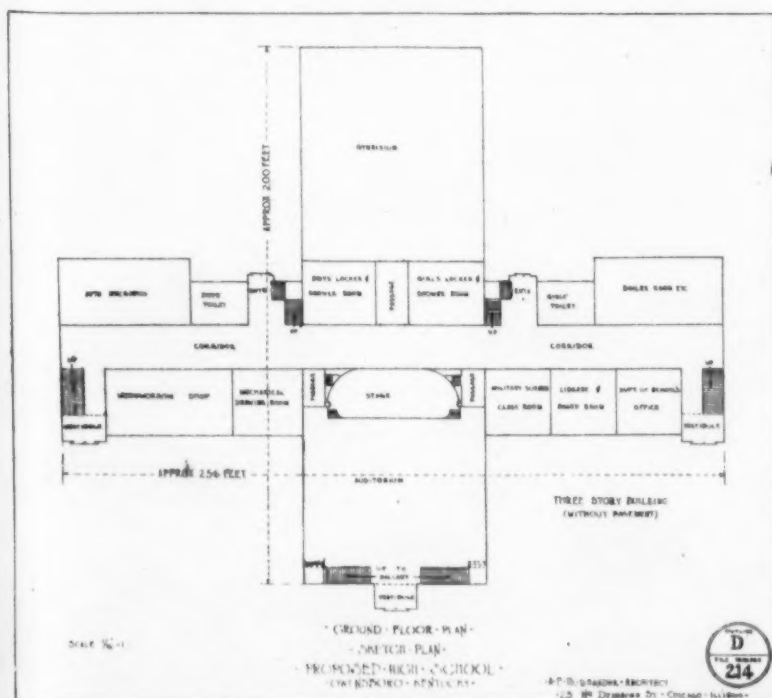
The capacity of a high school is dependent not only on the number of pupils who will take each study, but also on the length of the periods, the number of times each study is required per week, and the sizes of the classes which will be organized.

To illustrate: Suppose a chemical laboratory seats 24 students. It is used three double periods daily, and is fully occupied during a week of five days by three new groups for double periods each day. This laboratory will have a total capacity ($24 \times 3 \times 5 = 360$) of 360 students. If, however, chemistry is required for a double period, three times a week, the maximum capacity will be only one-third of 360 or 120 pupils.

By tabulating the number of pupils, the length of the periods, and the number of times a subject is given during the week, it is possible to construct a chart that will show the classroom, laboratory or shop capacity required for



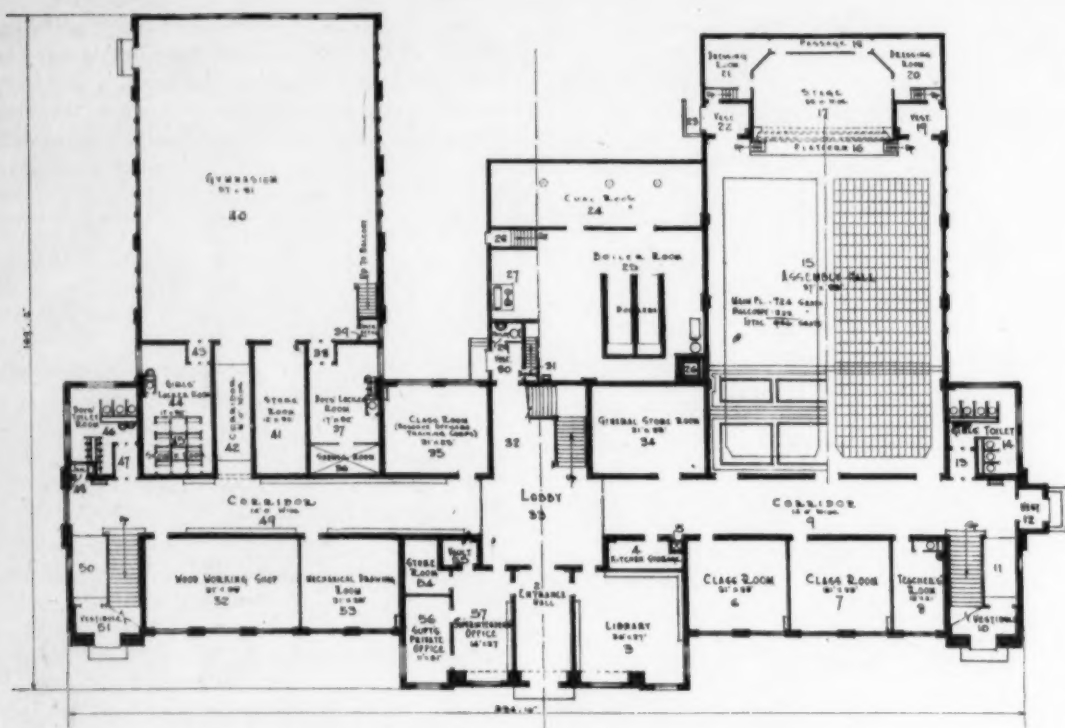
SCHEME C FOR OWENSBORO HIGH SCHOOL.



SCHEMES D AND F FOR OWENSBORO HIGH SCHOOL.



OWENSBORO HIGH SCHOOL, OWENSBORO, KY.
A. F. Hussander, Architect, Chicago, Ill.



FIRST FLOOR PLAN, OWENSBORO HIGH SCHOOL, OWENSBORO, KY.
A. F. Hussander, Architect, Chicago, Ill.

each study in each special room. To illustrate this principle, suppose a school of 600 pupils requires the pupils to take physical exercise in the gymnasium for a double period, twice a week. On the basis of fifteen double gymnasium periods per week, it would require gymnasium classes to be of an average of eighty pupils. Arithmetically this may be expressed thus: $600 \div 15 \times 2 = 80$. If gymnasium classes were required only once a week, the average classes would consist of forty pupils each, for every double period of the entire week.

For a school of 600 pupils, with a weekly program of thirty single periods per week, a total of 18,000 single periods would be required for the entire 600. If it were possible to have every pupil space occupied all the time during the entire week it would be necessary only to have a total of 600 pupil stations. This, however, is impractical, and it is necessary to provide some additional space for the irregular size of classes which do not at all times fill each room to its full capacity.

High School Data.

Working data for determining the size of a high school building can be compiled by tabulating on a weekly basis the subjects required by the course of study and by filling in opposite each subject the following information, taking each year separately:

- (A) The number of students in each subject.
- (B) The maximum size of classes in each subject.

(C) The classes required, (obtained from dividing the number of students by the size of the classes allowed).

(D) The number of times each subject is required per week.

(E) The class periods (C times D) which are required for each subject per week.

(F) Add together the first, second, third and fourth year total class periods for each subject separately.

(G) The periods per week (periods per day times days per week).

(H) The room required (F divided by G).

All classrooms and various other rooms can be used for duplicate purposes, and, by filing up vacant class periods in these rooms, it is possible to reduce the total number of classrooms required.

Provision must be made for the accommodation of students during study periods, either in classrooms or in special rooms. If special study rooms are not provided; the assembly hall can be used, by requiring students to sit a certain number of rows and a certain number of seats apart.

The lunch room may also be used for study purposes, (except during the lunch period), and when so used can be counted as a portion of the instructional space.

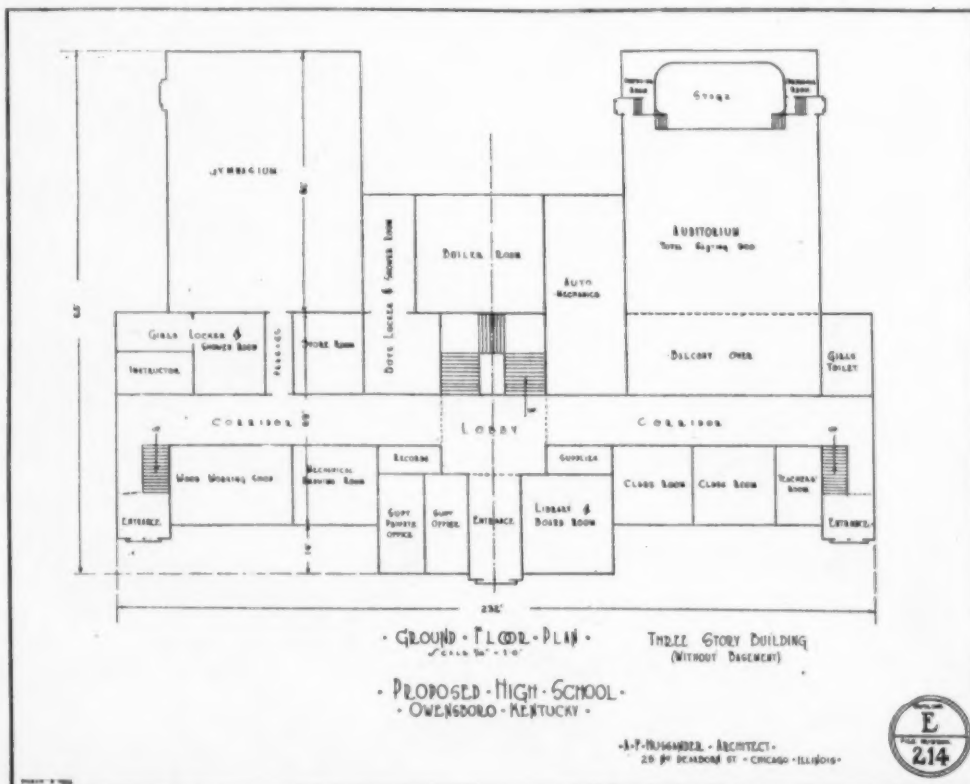
Assuming that the course of study is laid out for a school day of six periods, on five days a week, we have a total of thirty class periods per week. This schedule with a student membership of 600 will give a total of 18,000 student periods per week. To check up on the course of study and the individual student programs, find the total student periods by multiplying the number of class periods by the sizes of classes in each subject and add the result of all subjects together, including allowance for study or free periods for all students. This total should equal the total maximum student periods per week.

If these two total student periods do not balance, it will be necessary to make adjustments either in the number of recitations required or the amount of study or free periods allowed.

The sizes of rooms required for classrooms, laboratories, shops, etc., must be carefully figured out from dimensions of desks, tables, benches, cases, etc., with proper allowances for aisles, passageways, etc.

By adding together the square foot area of all the instructional spaces that are required in the classrooms, shops, laboratories, gymnasium, assembly hall, and other portions of the building used for instructional purposes, a total will be

(Continued on Page 133)



GROUND FLOOR PLAN

THREE STORY BUILDING
(WITHOUT BASEMENT)

PROPOSED HIGH SCHOOL
OWENSBORO, KENTUCKY

A. F. HUSSANDER, ARCHITECT
25 N. DEARBORN ST. - CHICAGO, ILLINOIS



A Science Laboratory and Classroom for Secondary Schools

Edna W. Bailey, Ph. D., and Laurence F. Foster, Ph. D.,
Supervisor and Assistant Supervisor of Science,
University High School, Oakland, Calif.

The history of science teaching can be read most clearly in two sets of documents: textbooks and building plans; for these are at once the resultant and determiners of teaching practices.

The first laboratory for teaching of which we have record was that of Vigani,¹ professor of chemistry in Cambridge, 1703-1712. This was fitted up in 1707, an old "lumber-hole" being made into an "Elegant Chymical Laboratory." The writer of a contemporary pamphlet says: "I am not of those who glory in running down Chymical observations and experiments; but yet with regard to this so famous Laboratory of Ours, I have talked with those that have gone the courses, and they all seem of the opinion that, as those matters are managed, the learned World is not like to reap any mighty profit or advantage from anything that is there taught."²

From this unfriendly beginning little progress was made until the great revival of science teaching in the latter part of the nineteenth century. Dr. Shipley records that when he began to study botany in 1879, "The only attempt at practical work was to hand around flowers in the lecture room, which we sometimes dissected, but I am afraid more frequently threw at the lecturer." He gives to Huxley in England and Martin in the United States the credit for inaugurating the modern system of laboratory instruction in biology.

The development of laboratory instruction has gone hand-in-hand with an increasing appreciation of the value of first-hand knowledge. "To look with the eyes is to confound the wisdom of the ages." The usefulness of the laboratory for teaching purposes has been generally recognized since the early eighties. First, in the colleges and universities, and some ten or fifteen years later in the secondary schools, fairly adequate provision for "practical work" was made.

Laboratories Too Expensive.

This provision has involved a very considerable increase in the cost of school plants. The question has been raised as to whether the educational usefulness of the laboratories has been great enough to warrant the large expenditures made on them. In a world so extensively "complicated by scientists" no price is too great for a nation to pay for the dissemination of science, especially among those students who are to be the leaders of its affairs; but the laboratory, as we have built it and used it in secondary schools, has too often discouraged and disheartened our students. One consequence of this state of affairs has been a renewed emphasis on demonstration work to replace much that is now done as individual work, particularly by younger students. This concession on the part of science teachers is readily seized upon by administrators, who see a welcome release from the burdensome expense of laboratory construction and maintenance. While there is no question as to the worth of demonstrations there are fundamental values in laboratory work, carried out individually or in small groups, which can never be obtained from the most skilful and illuminating of demonstrations. To obtain these

values, we must make certain modifications in science classroom procedure, and these in turn will demand appropriate modifications in science classroom construction.

A laboratory in a secondary school exists to afford students first hand contact with the tools and materials of science. It is not designed primarily for experimentation as is the research laboratory. The young student cannot, in the nature of things, discover all the generalizations of science through putting his own questions to nature. A great deal of wasted time and stupid pretense has resulted from our failure to admit this at the outset. First-hand contact with tools and materials may do three things for our students: (1) give them a richer background of experience out of which to build those general notions which are fundamental to science; (2) provide facilities for acquiring desirable specialized skills; and (3) open up a delightful world of opportunities for what Snedden has called "learning on the high-grade play level."

Interest Essential.

To fulfill any of these possibilities, the student must approach his laboratory experiences with a definite understanding of what he is about, and a zest for the undertaking which springs out of his appreciation of its value. "Laboratory experiments must concern a problem or a question which the pupil seeks to answer because he is interested in doing so."³ This attitude can grow only out of class discussions carefully planned to develop it. This involves, on the side of teaching technique, a new emphasis on class discussion and development of laboratory exercises and problems; and on the side of school-planning, provision for greater flexibility in the use of the laboratory facilities, and for a closer physical relationship between the classroom and the room for practical work.

This flexibility and closer relationship may be obtained most readily by the use of a room which is neither "lecture theater" nor laboratory, but a teaching workshop, providing physical facilities for all the essential means of teaching science which are at the disposal of the modern teacher, at least as far as these can be brought within the walls of a schoolroom. For want of a better name, we have called this a science classroom.

Science Rooms in Oakland.

The science classrooms described later were planned for the new plant of the University High School, Oakland, California. This city is engaged in an extensive school-building program, emphasizing especially adequate housing for its junior high schools. Under the leadership of the Superintendent of Schools, Mr. Fred M. Hunter, the policy adopted by the Construction Department has been one of most cordial cooperation with the administrative and teaching forces in working out building plans which should provide good teaching workshops, at reasonable cost, in buildings of creditable design and sound construction. The supervising architect, Mr. C. W. Dickey, has placed at the disposal of the writers not only his large and valuable collections of school laboratory plans and notes, but also the services of one of his assistants, Mr. D. V. Deuel, whose native ingenuity

and long experience in planning and equipping commercial and research laboratories have furnished by far the most valuable contribution this paper has to offer. The accompanying plates are evidence of his skilled draughtsmanship. The writers feel that the year's work under these conditions has afforded a liberal education, as well as great pleasure and satisfaction, which they are very glad to acknowledge.

Because of very definite financial limitations, the type of construction adopted imposed certain restrictions, to which these plans conform. Recognizing that others may face similar financial problems, it has seemed worth while to describe the plans finally chosen as offering a practical solution of our difficulties.

The school plant is intended to house a six-year junior-senior high school, with 600 pupils in the lower division and 600 in the upper. General science will be offered throughout the junior high school and the more specialized sciences in the senior high school. For purposes of economy and convenience in administration the rooms for the whole department have been grouped as a unit. This aids in securing closer coordination between the various courses and cooperation among the teachers of them.

What the Plant Includes.

It was decided that our first consideration should be to obtain a complete plant so arranged that each room would be available for as many types of work as possible, and that no essential phase of secondary science should be neglected.

Aside from the classrooms certain conveniences are provided for the use of the department as a whole. These are:

1. Outdoor laboratory, or science garden.
2. Science shop.
3. Science storerooms.
4. Visual education and lecture room.
5. Dark room.
6. Department office and library.

The provision of these special features makes it possible to relieve the science classroom of many details which are ordinarily necessary for good workmanship. This plan saves room and expense, and it is hoped will prove more efficient than the older scheme of outfitting completely each laboratory-classroom unit. These special rooms will be more fully described later.

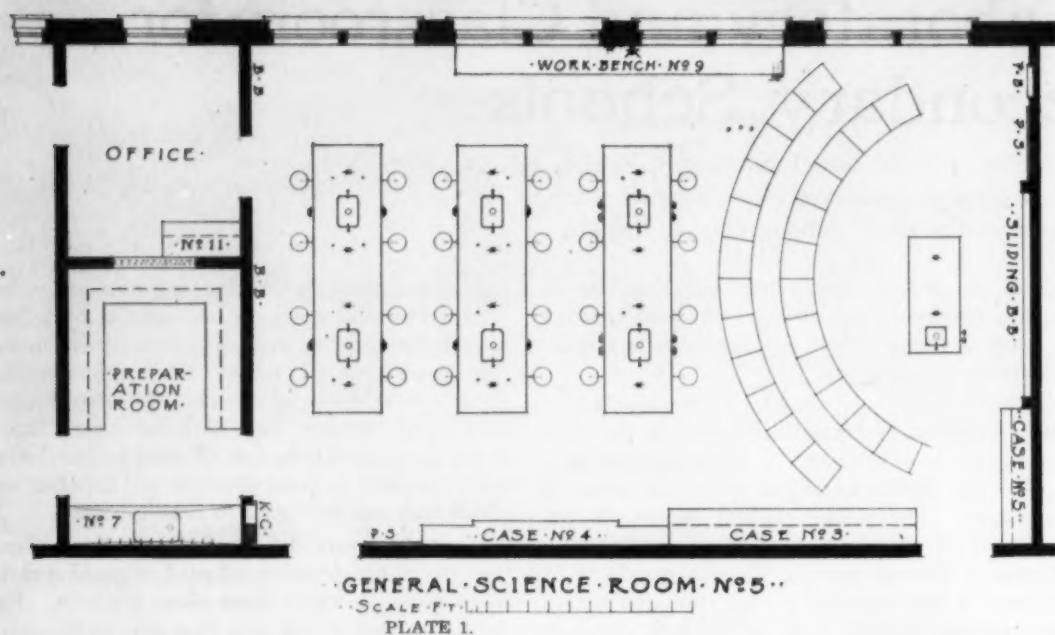
A science classroom was designed which, somewhat modified, serves equally well for general science, chemistry, physics, and biology. The room is planned to take care of 24 students,⁴ this much leeway being necessary in order to maintain a class of twenty throughout the year. The dimensions (24'x38') are satisfactory as to length but not as to width. This width was made necessary by the type of building construction adopted. The plans have been adjusted to it by a series of compromises which, it is hoped, will not seriously impair the working efficiency of the room, and which may secure some of the advantages of compactness and step-saving efficiency of the modern apartment house kitchenette.

⁴By using the demonstration table to accommodate six students, a class of thirty can be taken care of. This is not recommended except in emergencies. Where a class of thirty must be carried the room should be sufficiently enlarged to provide an additional laboratory table accommodating eight students.

¹See "Laboratories: Their Planning and Fitting"; by Munby. Introduction by A. E. Shipley. D. Van Nostrand, 1921.

²Quoted from Munby, p. XII.

³Bulletin No. 26, 1920, U. S. Bureau of Education.



Teaching Devices.

Since the class discussion holds a place of such prime importance among teaching means and devices, adequate provision for it has been our first consideration. A sliding blackboard and projection screen, a demonstration table, and a set of tablet-arm chairs are arranged at one end of the room. (See Plate 1.) The table has been kept as small as possible, but is fully equipped with sink, gas, hot and cold water, and both DC and AC current. Where possible, a small detachable fume hood has been included in this equipment. The side of the table facing the class carries large shallow drawers for holding maps, charts and diagrams, in dust-free, readily accessible form. The opposite side of the table is fitted to accommodate necessary materials. (See Plate 2, Figs. 1 and 2). In adjacent wall space a cabinet contains everything that would ordinarily be needed in demonstration work.

The remainder of the room (about 24'x22') is devoted to the work-tables and their accompanying storage cabinets. Three tables, (13'x3'4") are placed across the room, with apparatus case and students' service case along one wall, and window-shelf and work bench under the windows along the opposite wall. Office and preparation room open from the rear of the room.

If it were possible to set the tables parallel to the long axis of the room instead of at right angles to it, certain advantages would be obtained; the narrowness of the room, however, makes that impractical.

Each section of the apparatus case (Plate 3), which is placed adjacent to the laboratory tables and at right angles to them, is designed to serve a group of eight pupils, furnishing the group with one section of four drawers and four shelves. This leaves two sections of drawers and one section of shelving for extra storage space. Experimental work may be carried on by individuals, by small or by large groups; but the unit of eight pupils assumes entire responsibility for the care of such community property as sinks, hoods, reagent bottles, iron supports, and the materials stored in its section of the apparatus case.

Students' and Microscope Cases.

Adjacent to the apparatus case is a student service case, consisting of students' lockers, a notebook case, and a microscope case. This is placed near the door and provides a pigeonhole for each student's notebook, and a larger compartment, his for the period only, in which he stores his books and other impedimenta. This scheme saves table space and protects the covers of the school textbooks. The microscope case, (Plate 4) provided in all except chemistry and

physics rooms, has dust-free compartments, protected by sliding glass sashes. It is felt that these cases will provide a fairly adequate set of individual and group working materials, and should materially diminish aisle crowding and general student traffic about the room. The whole aim of this unit is to suggest to the student that a laboratory is indeed a workshop, affording little opportunity for anything but consistent application to the business in hand.

In attempting to design laboratory furniture to fit the dimensions of the rooms provided we found it not advisable to install work tables accommodating less than eight pupils when the room is to be under 28 feet in width. The ideal laboratory should be at least 30 feet in width, provided with tables accommodating groups of four pupils each, with adequate aisle space between the various units. Owing to the limitations of the type of building construction adopted, it was not possible to furnish classrooms more than 24 feet in width, with the result that we were forced to use an eight-pupil table. Placing four pupils on a side, each one has a working space of 39"x20", with an individual gas outlet; and a water faucet, a DC outlet and a fume hood in common with his neighbor. Each student has an individual drawer, except in the general science classes, where two students are assigned to one drawer. A swinging stool, 22" from the floor, is employed to reduce the aisle-crowding and disorder.

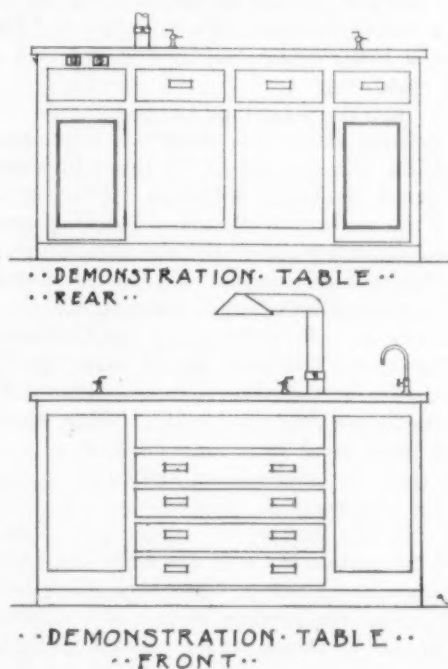


FIG. 1 AND 2.

Table Equipment.

The table top, of non-warping maple construction, is provided with two sinks of convenient dimensions for the collection of gasses, and sufficiently deep to prevent undue spattering of water. The chemistry tables (See Plate 5) are provided with reagent shelves of plate glass sufficiently low to be convenient for the pupils and to give the instructor an unobstructed view of every point in the room. Small threaded sockets are placed in suitable positions to receive iron supports, thus obviating the necessity of storing clumsy iron ring-stands. The sockets, of nickel-plated brass, are non-corrosive and are deep enough to render the supports very rigid when in position. When not in use the supports may be stored in small wooden troughs at the ends of the tables.

All work tables excepting those in the chemistry rooms are 32 inches in height, with stools 22 inches from the floor. The chemistry tables are 36 inches high, with stools 26 inches from the floor. The lower table is advised for rooms in which any microscopic work is to be done. The tendency in modern laboratories seems to be distinctly away from the very high tables used a decade ago. There is special need to consider height carefully in rooms designed for junior-high-school students.

In the chemistry rooms one vent hood is provided for each two pupils. It was felt that the ordinary provision of one or two fume hoods along the side wall of a laboratory was so inadequate as to be practically useless. Experience and observation show that such fume hoods are usually cluttered with the odds and ends of typical laboratory "glory-holes," indicating their very infrequent use. There is no doubt that the fumes so constantly in evidence in laboratories are far from beneficial to the human respiratory tract. This is particularly serious for the teacher, who must spend his whole working day in such an atmosphere. It was hoped that by providing plenty of well-ventilated hoods conveniently placed, the student might be induced to use them, and so spare his own lungs and those of others. The fume hoods (Plate 5) are vented by a fan operated by a two-horse power motor. One hood may be shut off by a damper while its mate is in use. All hoods are adjustable as to height and position and may be entirely removed and stored in the small cupboards at the two ends of the work table, the vent hole being covered by a small metal lid.

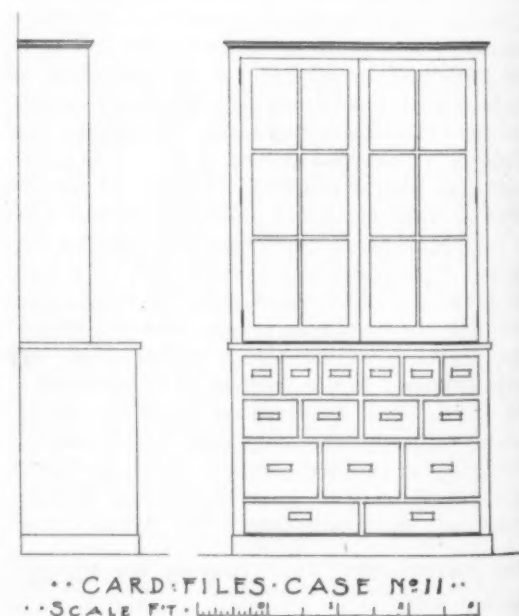
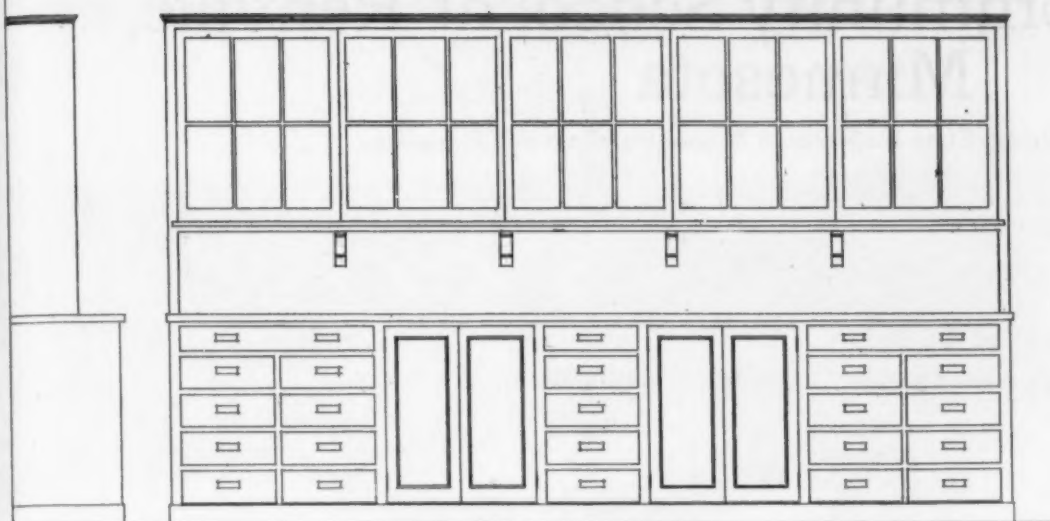


FIG. 3 AND 4.

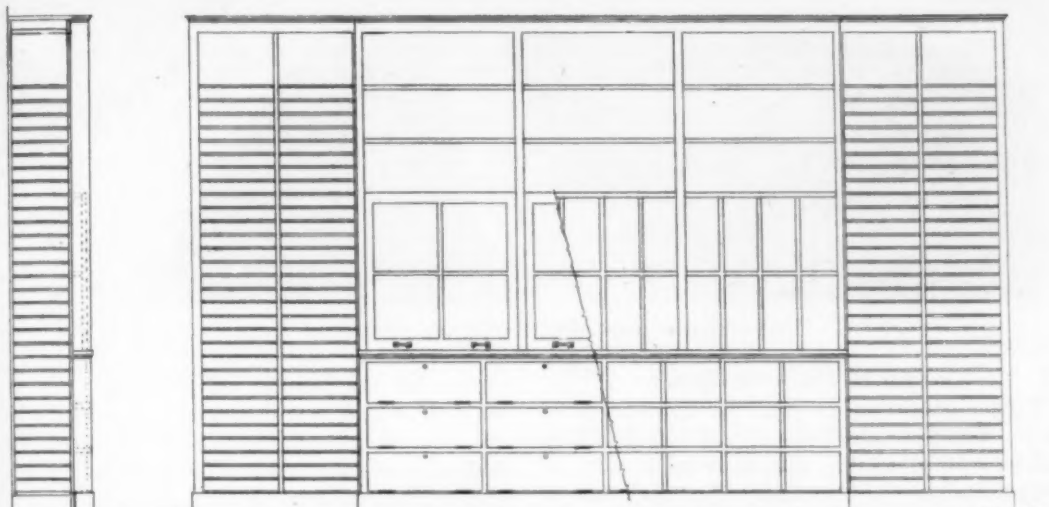


END

APPARATUS CASE No. 3

SCALE FT. 1 2 3 4

PLATE 3.



SECTION

ELEVATION CASE No. 4

SCALE FT. 1 2 3 4

PLATE 4.

Store Rooms and Offices.

The plan here followed, which does away with separate laboratory and lecture room, leaves no space in the classroom for a teacher's desk or personal belongings, such as books, records, teaching aids, etc. Neither are there conveniences or room for the preparation of teaching material, nor for the unescapable "clearing up" which has to be done, even after the best of classes. There is also need for storage facilities, in addition to those provided by the apparatus cases in the classroom. Considering the substantial saving made by utilizing one room instead of two for the work of a class, it is not unreasonable to urge the provision of special rooms to meet these special needs.

These plans provide at least one office for two teachers, and at least one preparation room for two classrooms. The offices are placed to secure good light, and may or may not be divided from the preparation room by a glass partition. They are furnished with built-in bookcase and filing cabinet. (Plate 2, Figs. 3 and 4.) The preparation rooms are equipped with cases, cupboards, drawers of various dimensions, sink and drying rack.

A small amount of reserve supplies and equipment may be stored here, as well as pieces of special apparatus; but this room is not designed to provide for all the reserve stocks necessary for the year's work, nor to house apparatus which is used in common by the whole department. The ill-smelling, dark, crowded storeroom of the old-fashioned laboratory afforded admirable opportunity for expensively bad housekeeping. The present plan contemplates a general school storeroom, under the

charge of a custodian, and, adjacent to this and under the same charge, science department storerooms, in which will be kept reserve stocks of supplies, equipment and chemicals. The custodian keeps a strict account of the income and outgo of materials. An intercommunicating telephone system and an elevator make it easy for the teacher to obtain any desired item.

The two science storerooms are in the shape of an L with a fireproof sliding steel door between. The inner room has reinforced concrete floor and walls in satisfaction of the requirements of the fire insurance underwriters. One room of this character readily houses all of those corrosive and inflammable chemicals which have no place in the preparation rooms on the upper floors. In addition it removes these dangerous chemicals from the immediate neighborhood of the pupils. Carboys of acid are placed upon a low platform in the middle of the room while other chemicals are arranged in open cases around the walls. The outer room serves for the storage of all excess stocks. One wall of the outer room is fitted with bins of different sizes, fronted with riser boards for the storage of various supplies such as corks, stoppers, flasks, beakers, etc. The other walls have shelving for bottles, battery jars, etc., and a special rack for glass tubing and rodding.

Visual Education Provisions.

Visual Education may serve two important purposes in science teaching: (1) it may be closely integrated with the work of the class, serving as one of the classroom means utilized by the teacher in putting over a unit of subject matter, or (2) it may be employed as an extra-classroom means of stimulating interest and

vitalizing the subject matter of the science course. Visual education in the science classes is carried on through the medium of (1) stereopticon slide projection, (2) motion pictures, (3) opaque projection, and (4) picture material from magazines and pamphlets.

Easy availability of the materials needed for the work must be a primary consideration in planning to use visual education as a classroom device. Otherwise, so much time is consumed and the attention of the class so thoroughly distracted, that the teaching value is greatly reduced.

The equipment of the science department should include a combined stereopticon-balopticon and a portable moving picture projector. These should be mounted on movable stands to permit ready moving from room to room. Outlets for alternating current electricity have been installed on the work table nearest the front of the rooms so that connections with current source may be made easily and quickly. The demonstration materials case serves for the storage of slides, and pictures for opaque projection. The rooms are darkened by means of heavy window shades fitted into a light trap carried on the window casings. The wall behind the sliding blackboard has been covered with a special preparation rendering it entirely suitable for all types of projection.

In carrying on visual education with larger groups of pupils a lecture room accommodating about one hundred pupils is necessary. The room should be equipped with tiers of raised seats, a high grade projection screen, and a fireproof projection booth. Certain picture films, or sets of slides, may here be shown to large groups of pupils. The room may also be employed for lectures by teachers, pupils, or outside speakers, demonstrations by pupils, or science plays and pageants. Such a lecture room should also be available to other departments of the school; in fact it might well operate as the center of visual education in the school.

The Science Shop.

One of the most important adjuncts to the science department of the modern junior or senior high school is the science shop. Each science classroom contains a work bench equipped with a Toles quick-acting vise and drawer space for tools, nails, screws, bolts, etc. (See Plate 6). Ordinary emergency repairs and simple construction work may be carried on here by either teacher or pupil, but for the accomplishment of projects involving construction or for the building of various pieces of apparatus the science shop fills a real need. In addition to serving as a place for the construction of such articles as mineral cases, mounting boxes, trellis frames, cold frames, animal houses, window boxes, bird houses, and paraphernalia for insect collections, the shop may prove useful as a field for such activities as taxidermy, the preparation of skeletons, the preparation of flowers for mounting, or the binding of pamphlets and books.

In our school plant the science shop has been placed in a very advantageous location, easily accessible to pupils and teachers from any of the classrooms. Extending across one entire side under the windows is a long work bench, fitted with two Toles vises. Liberal drawer space has been provided below for the storage of small tools and construction materials, while above the bench and between the windows is a thirty-inch riser of wood upon which the larger tools are hung. A small motor-driven lathe is eventually to be installed in the space provided for it on one side of the room. Partially

(Concluded on Page 125)

The New Community School at Renville, Minnesota

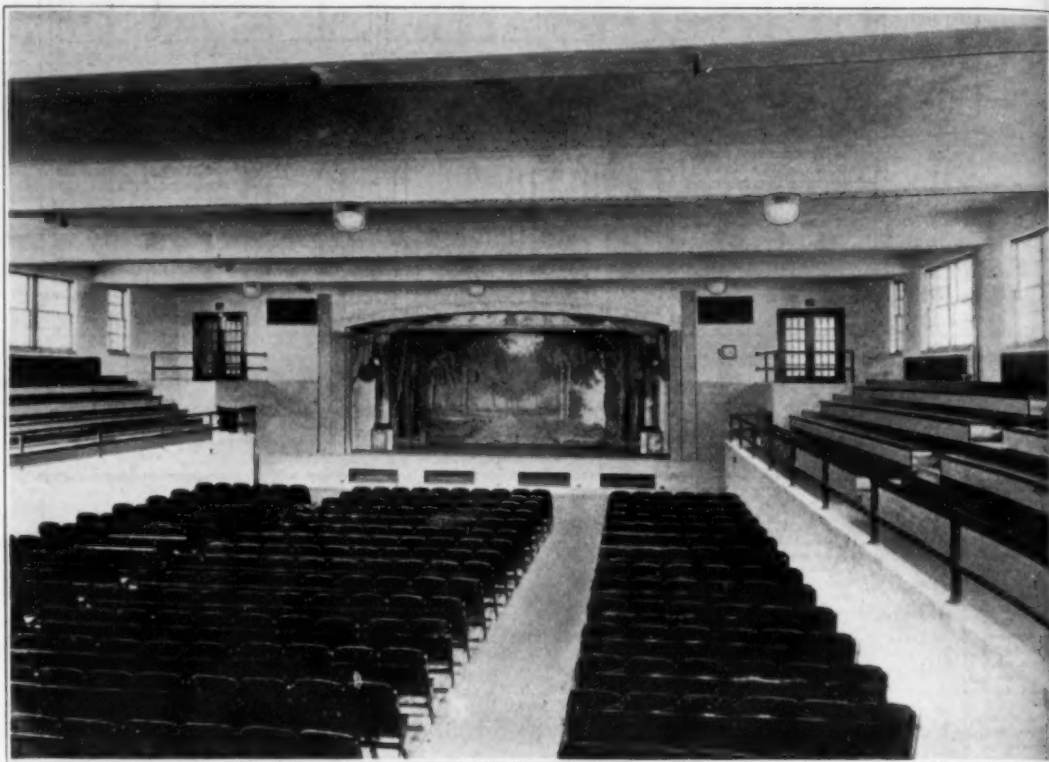
Samuel A. Challman, State Inspector of School Buildings for Minnesota.

Buildings for Minnesota.

The new schoolhouse at Renville is a good example of the two-story type of school buildings now being erected in the progressive communities of Minnesota with a population of from one to ten thousand. Beginning with a 24 room grade building at Ely, erected in 1914, the type has been gaining in favor, until at the present time about one-half of the new buildings, erected each year, belong to this class. The reason for its popularity is apparently due to its congruity to the residence section of a community; to the comparative safety of human life, in non-fireproof buildings in particular, since the second floor is not over fifteen feet above the ground; to the elimination of a succession of irksome stairways by confining the activities of the school to two floors; to the ease with which small children, in particular, are enabled to reach their rooms without climbing more than four or five steps in order to reach the first floor; and to the healthful conditions which obtain in buildings in which children are not compelled to do industrial work or recite in rooms with floor levels below the surface of the ground.

While high schools and special schools for pupils of high school age will for obvious reasons continue to be three- and four-story structures, the elementary school and the combined high and elementary school are almost certain to prove much more convenient and better adapted to their purposes, if they are built not to exceed two stories in height. The one-story school also has its place, and as an elementary school or a combined high and elementary school it is admirably adapted to sites which permit of its erection without encroaching upon the space needed for playgrounds.

Attention to this type of building in Minnesota was secured by giving publicity from time to time to the places which erected two-story schoolhouses, and, as the list grew, its influence naturally became more marked. Too long have we tolerated in the western agricultural states as well as in some other states, the skyward propensities of grain elevators and schoolhouses, vying with each other to reach high altitudes. As we are entering upon a period when larger school grounds are being secured, in order that the physical activities of school children may be properly provided for, we may well drop out of the contest with the grain elevator and keep our schoolhouses close to the ground.



AUDITORIUM, COMMUNITY SCHOOL, RENVILLE, MINN.

Growth of Public Sentiment.

Public education in Renville dates back to 1878. The first school was opened in a dwelling. School was in session during three months of winter and two of summer. The total cost of operation during the first year was \$90, of which \$80 was paid to the teacher and \$10 expended for fuel. The first schoolhouse was built in 1879 at a cost of \$275. This soon proved inadequate and in 1882 a new building was erected at a cost of \$800. Six years later this was supplanted by a four-room building which in 1894 was entirely wrecked by a cyclone. An eight-room building was then erected at a cost of \$12,000 and in 1891 an addition was built at the same cost as the original structure. This building was gutted by fire during the Christmas vacation in 1919. For over two years the schools were maintained in temporary buildings and rented quarters.

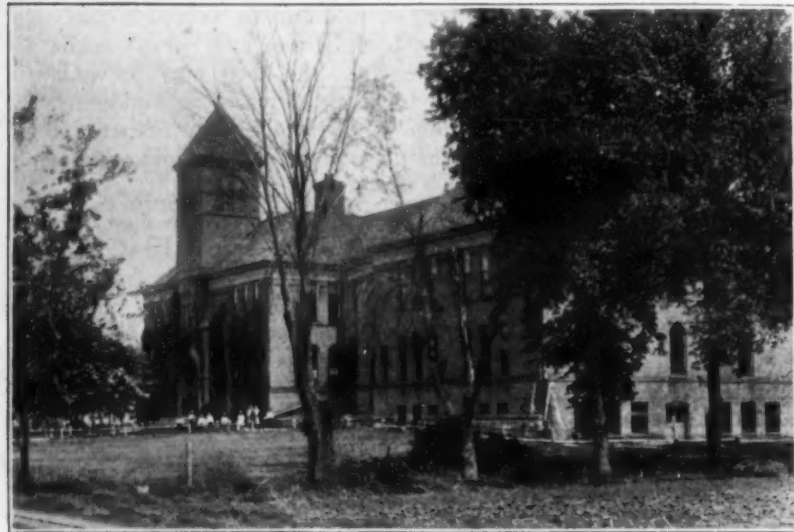
In May 1921 the contract for the general construction of a new building was let and ten months later the building was ready for occupancy. An illustration of the old building is

shown for the purpose of contrasting it with the new, which was erected at a cost of \$286,785, including architect's and engineer's fees. Not only is the contrast of the outside appearance of the building striking, but of even more significance is the remarkable growth of public opinion, in a score of years, which made possible the erection of a building, providing for a greatly enriched curriculum and this at a cost of nearly twelve times as much money as the district had invested in its old building.

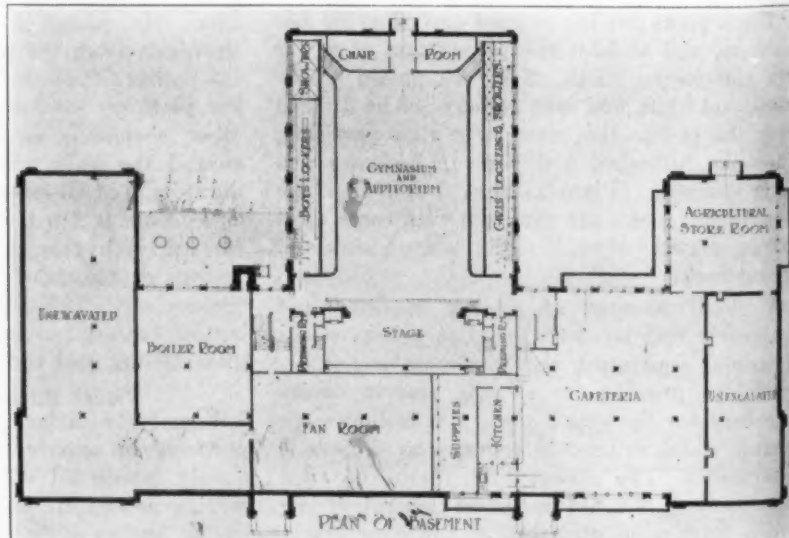
Possibly no more powerful argument as to the popular approval of public education can be produced than just such instances as this.

New Building Fireproof.

The new building is of substantial construction and has been made fireproof throughout. The outside walls are variegated brick and hollow tile. All partitions are tile. The trimmings are stone. Corridor floors and stairways are done in terrazzo and toilet room floors are of vitreous tile. The interior trim is oak, and the schoolroom floors are maple over reinforced concrete slab.



THE OLD HIGH SCHOOL, RENVILLE, MINN. DESTROYED BY FIRE IN 1919.



BASEMENT PLAN, COMMUNITY SCHOOL, RENVILLE, MINN.



COMMUNITY SCHOOL, RENVILLE, MINN. Croft & Boerner, Architects.

The extreme dimensions of the building are 243 feet, 7 inches, by 102 feet. Provision has been made for additions to either or both of the wings and the grounds are ample for any such enlargement without detriment to the playground.

The building has a capacity for 350 grade pupils and 150 high school pupils on a basis of an 8-4 school organization. There are six grade rooms on the first floor and three on the second. The high school study room, complemented by five recitation rooms, is on the second floor. Other rooms devoted to instruction are two laboratories, two teacher training rooms, a commercial department, a home economics department, a manual training department, an agricultural department, a library and a combined gymnasium-auditorium. The total amount of floor area of all rooms used for this purpose is 30,947 feet, or 49.6 per cent of the entire floor area.

As this building, owing to the large number of children in attendance from adjoining farms, necessarily had to be provided with a fair sized cafeteria, a kitchen, storage room, and a lavatory, the amount of floor space for this purpose is unusually large, constituting 4,430 square feet or 7.1 per cent of the total floor area. In

the more common type of building of this size, the cafeteria is omitted and space for similar purposes is about one-seventh of the area here provided. The greatest part of such area would be added to the area for instruction which would then constitute between 53 per cent and 54 per cent of the entire area of the building.

The rooms for the heating and ventilating plant in the basement contain an area of 4883 square feet or nearly eight per cent of the total. The floor area of rooms for administration consisting of an office, a nurse's room and a teachers' room is 750 square feet or 1.2 per cent of the whole. Coat rooms and toilet rooms occupy 2600 square feet or a trifle over four per cent. Flues require an equal area. Walls and partitions 7460 square feet or twelve per cent, and stairs and corridors 8676 square feet or fourteen per cent.

As compared with the standards proposed by the Standardization Committee of the National Education Association, these percentages tally closely with those fixed for the most satisfactory buildings.

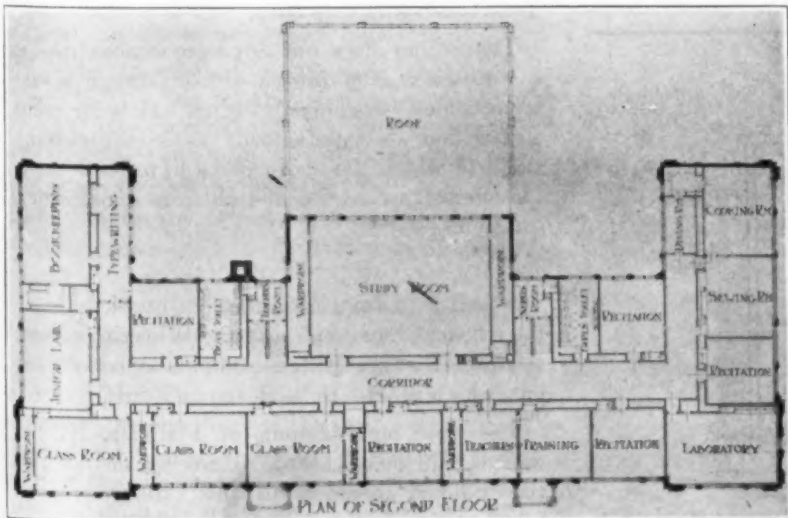
A glance at the diagrams of the floor plans will show how carefully the entire plan has been worked out so as to obtain satisfactory conditions from an educational as well as physical

standpoint. The library which serves both the community and the school may be opened to the public without opening the entire building, as may be noted by the diagram of the first floor. The heating and ventilation of the room is independent of the other rooms of the building. The gymnasium-auditorium has open floor space large enough for basketball and seats for spectators in the bleachers. The total seating capacity of the room, when used as an auditorium, is 1200.

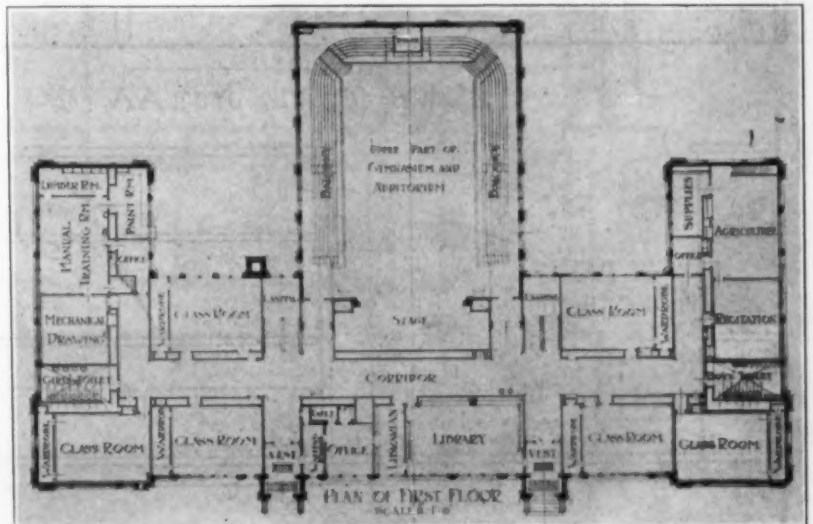
The building is equipped with a fan system of ventilation and an air washer. The standard amount of air at the rate of 30 cubic feet per pupil is introduced into all classrooms and industrial rooms. Four changes of air per hour are provided for the auditorium-gymnasium.

The building comes under the provisions of law for a consolidated school and in consequence the school district has received as building aid the full amount allowed by law which is \$6000. Under other statutory provisions annual aid in the following amounts are made available: high school aid, \$1000; elementary school aid, \$400; general industrial aid, \$600; home economics aid, \$600; agricultural aid, \$1000; commercial department aid, \$600; teacher training

(Concluded on Page 126)



SECOND FLOOR PLAN, COMMUNITY SCHOOL, RENVILLE, MINN.



FIRST FLOOR PLAN, RENVILLE, MINN., COMMUNITY SCHOOL.

A Compact Woodwork Shop

E. M. Wyatt, Director of Manual Training, Dallas, Tex.

Plenty of floor space is highly desirable in a woodwork shop. It would be pleasant to plan a shop for an educational air castle, but the author feels he will be safe in assuming that he will be helpful to many more readers if he undertakes to solve the more every-day problem of how to get as much as possible with a very limited floor space. This is the author's solution to this very frequent problem in his experience of what equipment can be installed in a standard classroom. Such a room is ordinarily about 22 feet by 32 feet. The problem and solution as presented assumes that there are no auxiliary rooms available for lumber, finishing, etc.

Reference to the floor plan, Fig. 1, shows that the benches are built as a unit around the room with the exception of one single pupil bench which serves as the instructor's demonstration bench. With this bench a class of twenty students can be accommodated. This bench arrangement has the following advantages:

1. It is very economical of floor space, since there is no unusable space at the rear or ends of the individual benches.
2. It leaves a large central space for assembling, cutting stock, or for a machine or two.
3. The instructor has a view of the tops of all the benches unobstructed by tool racks.
4. The benches are heavy enough not to shake when in use.
5. It is especially suitable for a room with irregular shaped floor plans, as illustrated in Fig. 2. Plans B, C and D have the same overall dimensions as A, but less floor space, yet have an equal or greater space for wall benches.
6. It is the most economical bench in cost. It can easily be built by pupils and teacher.

Teachers who have used this type of bench arrangement never want to change back to one where the room is full of benches and has no open space for work.

The detail drawing of the benches, Fig. 3, shows fully the bench construction which has evolved out of repeated installations. It is easily and cheaply made and is entirely satis-

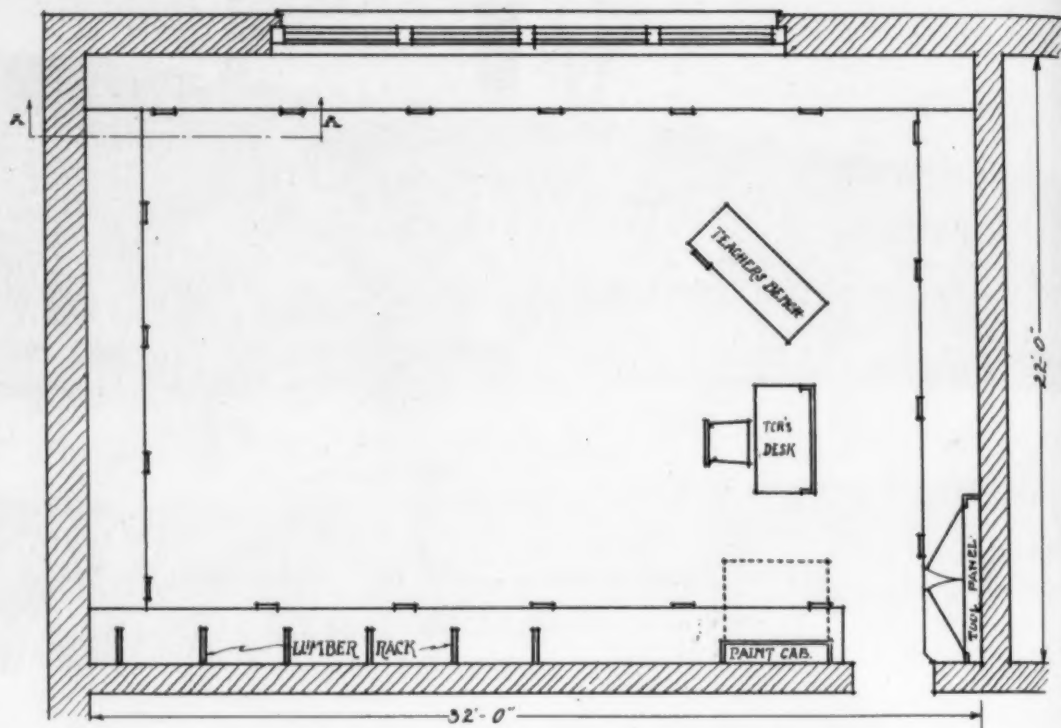


FIG. 1. PLAN OF A COMPACT MANUAL TRAINING WOOD SHOP.

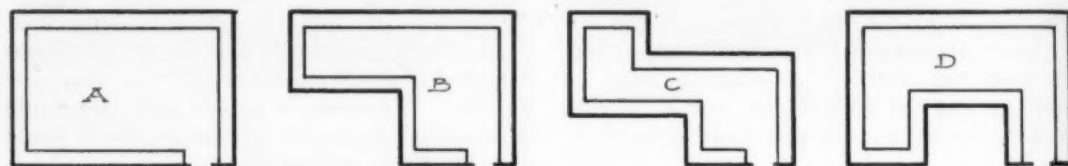


FIG. 2. LAYOUTS OF IRREGULARLY SHAPED ROOMS.

factory. The tops are usually made of two $2\frac{1}{2}$ "x12" oak bridge planks, though sometimes varied by using a glued-up top of 1"x3" strips, and also by substituting a 1"x12" in place of the rear plank shown. When this last is used it is blocked up underneath to give a flush top.

The locker arrangement eliminates a lot of keys, gives each pupil an individual bin, and provides for stock too large for the individual bins being placed across the tops of the individual bins.

The instructor's bench is placed facing a corner that the pupils may be seated on the corner benches, three pupils per bench, during demonstrations.

Since the lumber must be kept in this room the lumber brackets are placed on the wall over the benches at the rear of the room. These benches are not assigned students in the smaller class groups.

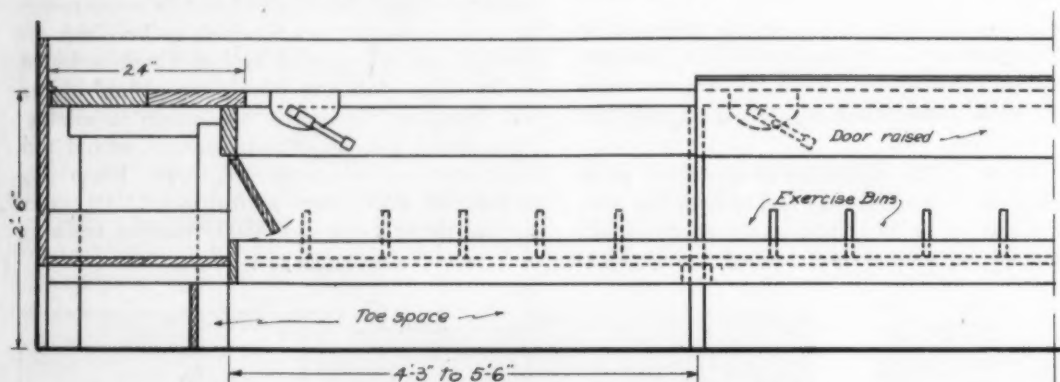
The tool cabinet is placed over a bench never assigned regularly to a pupil. In larger classes where students rotate in acting as tool monitors, the one acting in this capacity always takes this bench. This permits him to work on his project when not busy distributing tools.

The paint cabinet is a messy item of equipment with most teachers. The one shown, Fig. 4, has the merit of concealing the almost inevitable unsightly smears from view and also providing a finishing bench. There will be no good excuse for stains and paints being on the work benches in this shop.

The author does not advocate concentrating a woodwork shop into a one classroom space from choice. However, it often has to be done and seldom as satisfactorily as in the several shops in which the above plans have been used. He offers it as a tried and entirely satisfactory solution.

Nothing like a pat simile. "Get away from the ox-cart education," says Dr. Winship. Now, then, that suggests the automobile education, but, which is it? Rolls-Royce or Ford?

The civic organizations of Flatbush, N. Y., want a paid school board. Here is a chance for the indicted members of the Chicago school board to get another job.



BENCH DETAIL - SECT. A-A FIG. 3

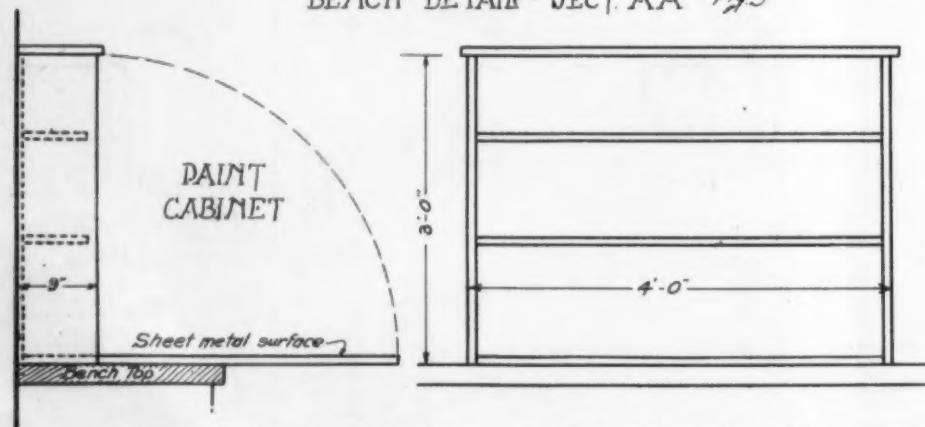


FIG. 3 (ABOVE). DETAIL OF BENCH. FIG. 4 (BELOW). DETAIL OF PAINT CABINET.



VOCATIONAL SCHOOL, MADISON, WIS. F. L. Kronenberg, Architect.

The New Vocational School at Madison, Wisconsin

Louise F. Troxell.

Anyone who has ever lived in a shabby, inconvenient house and who has longed for and finally achieved a beautiful home will appreciate the feelings of Director A. W. Siemers and his staff of teachers when they moved into their new quarters.

Mr. Siemers and the vocational school system of Madison are synonyms. It was in 1912 that industrial education was begun by the city and it has never known any other leader. The work has been housed here, there, and everywhere during the nine years of its life. Until recently one department was over a ten-cent store, another in rooms adjacent to a dancing academy, while still others were scattered over the business part of town. Correlation of work was difficult always and in some cases impossible.

But the completion of the new vocational school building has brought a change and now students have opportunity for either day or evening study in all industrial lines, together with many cultural advantages.

The site of the school is unusually advantageous, placed as it is in the center of town, one block from the square which contains the state capitol and around which are located most of the business institutions. It is in an almost direct line between the capitol and the state university and near to both; a desirable situation when one observes that the state vocational director's staff is housed in the capitol and that many of the vocational teachers are taking advanced work at the university.

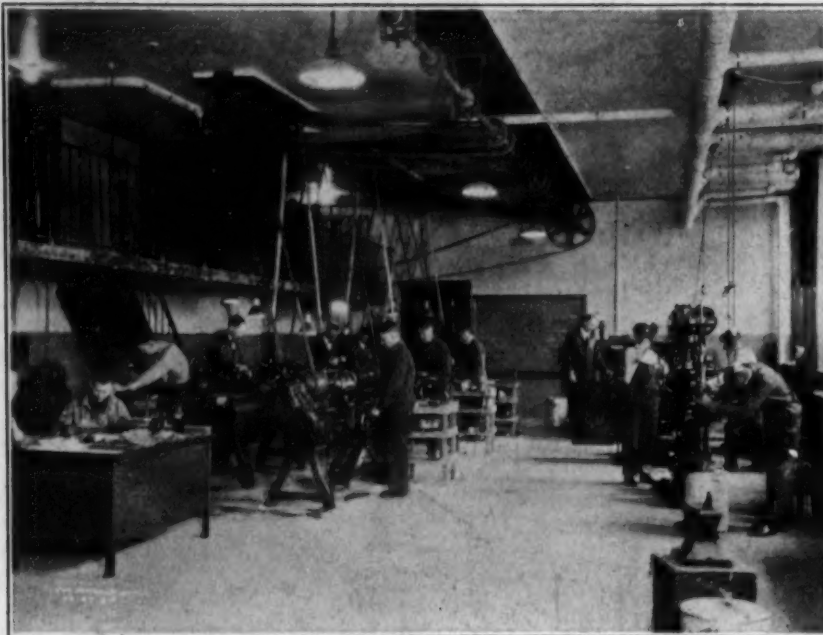
The architecture of the new building was determined several years ago when the city high school was erected as that building formed the first unit of a system that is soon to cover an entire square block.

The high school was built on Wisconsin avenue and occupies the block between Dayton and

Johnson streets. The vocational school joins the high school on the Johnson street side, extends one block to North Carroll, and thence one-half block back toward Dayton. This leaves one corner of the square which is at present occupied by a church. Complete plans, however, have already been drawn for an addi-



BASEMENT PLAN, VOCATIONAL SCHOOL, MADISON, WIS.



MACHINE SHOP.



HOUSEKEEPING SUITE.

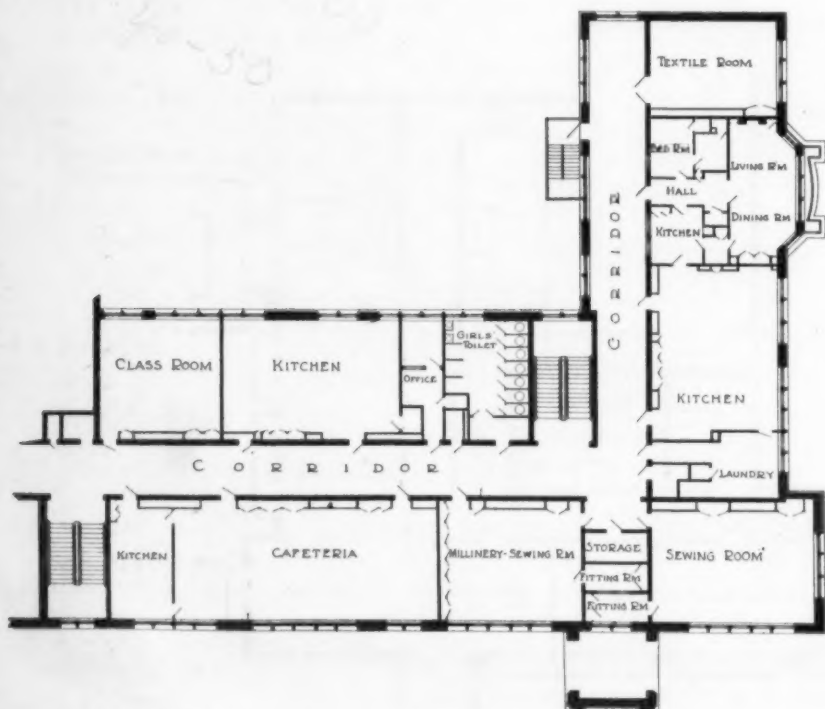
VOCATIONAL SCHOOL, MADISON, WIS.



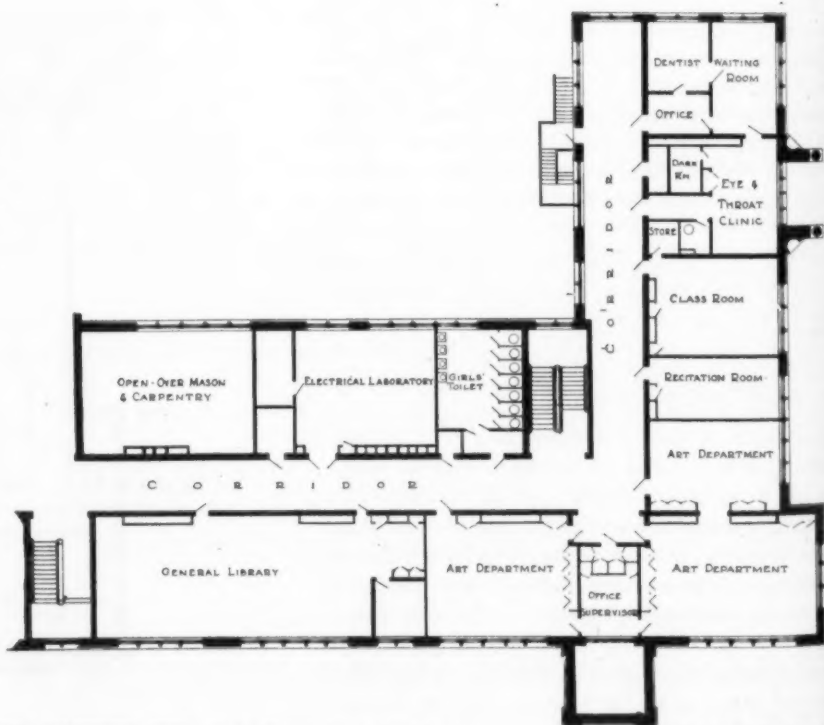
THIRD FLOOR PLAN.



GROUND FLOOR PLAN.



SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

FLOOR PLANS OF THE VOCATIONAL SCHOOL, MADISON, WIS. F. L. Kronenberg, Architect.

tion which will fill this space. The need for more room is already present; it only remains to raise the necessary funds. The unit to be added will be joined to the original high school building by a triple-arched driveway entering a court which is being left open for loading and unloading supplies.

The exterior of the vocational school is simple and dignified. There are four floors above the basement. The outside walls are of western colonial brick, trimmed with Indiana limestone. Inside, the halls are like those of the high school which they join. The walls are of brick arranged decoratively with white above and red below, while the floors and stairways are of terrazzo. Individual steel lockers are placed in the halls on all floors.

The numbering of the floors was something of a problem. When the high school was built, no basement was planned and the grounds were terraced. But for the vocational school it was necessary to have a basement, and the ground that would have formed the terrace was removed almost to the street level. It is obvious, then, that what would ordinarily have been called the first floor of the vocational school did not join on to the first floor of the high school. Hence, it was decided to call the floors basement, ground, first, second, and third floor, respectively.

The ground floor contains the director's suite, drawing rooms, a study hall, a crafts' room, a printing plant, a boys' toilet, and a large construction room for teaching building trades.

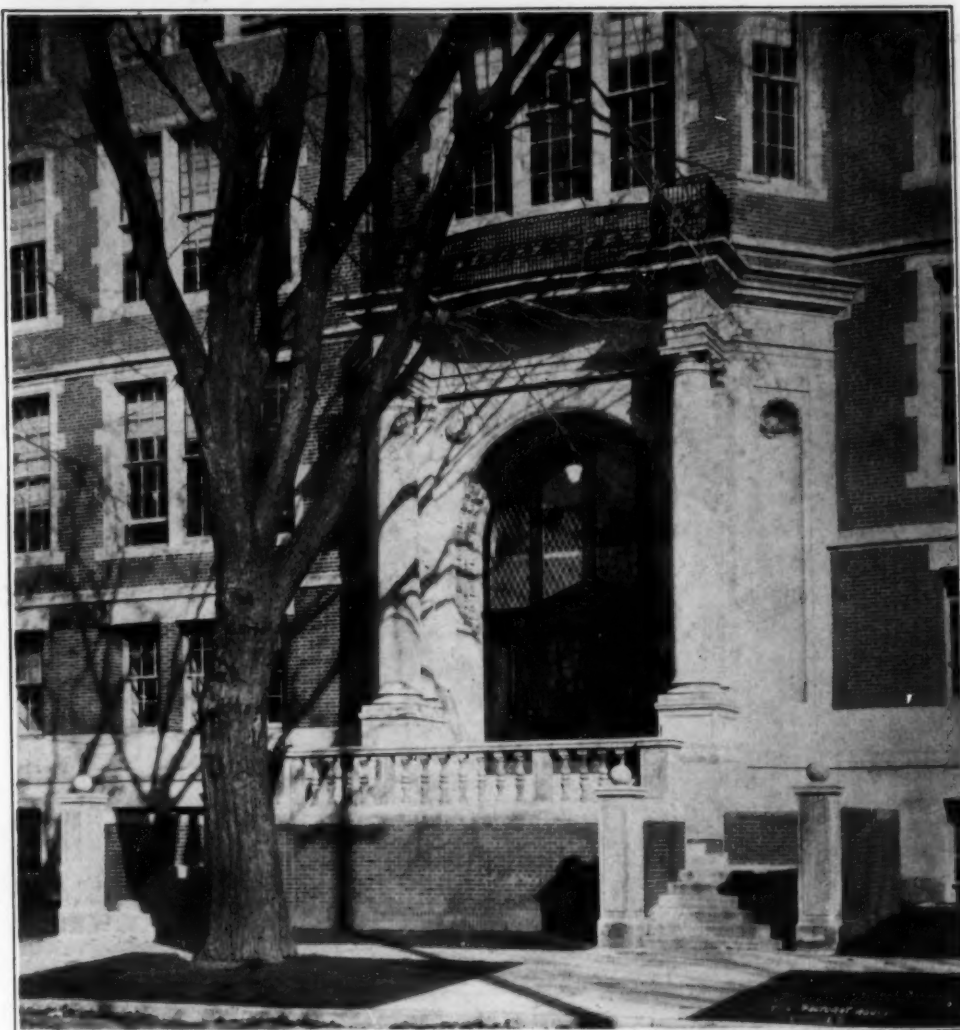
The director's suite consists of a well furnished private office, a secretary's office, and a waiting room. These are situated at the left of the main entrance, the private office having a separate entrance in addition to the one through the waiting room. In the secretary's office is an electric clock which is set once a week to run the five days' schedule of classes. It rings the bells and automatically changes the intervals as the program changes.

Probably the most interesting feature of this floor, however, is the construction room. This is two full stories high and is adapted to the application of all the building trades that are taught in other parts of the school. The room is not large enough to accommodate a full-sized dwelling but the plan is to erect complete houses in sections. Each section will be completed, even to electric wiring, gas, and plumbing fixtures. This will bring into practice all phases of building from plan drawing to interior finishing. The class has made such simple projects as a twelve-by-sixteen-foot garage which was later sold.

In the basement are the woodworking shop, forge room, machine shop, stock rooms, paint room, and molding room. Here also is the girls' gymnasium with separate entrance from the high school.

The machine shop is unusually well adapted to practical work. A considerable number of mature federal board students are enrolled in the three-year course and give promise of becoming expert machinists, not only specialized in one line, but skilled in many. The students make and grind all their own small tools and also build machines. A large concern that manufactures grinding machines furnishes the department with castings and buys the finished product. The head of the department estimates that his students can make for thirty dollars a machine that it would cost between seventy-five and one hundred dollars to buy.

A visitor to the building who has inspected the ground floor and then gone to the basement next because it is easier to go down stairs than up, finds himself painfully aware that it is two long flights up to the next department. But,



DETAIL OF FRONT ENTRANCE, VOCATIONAL SCHOOL, MADISON, WIS.

no, here is the nicest little elevator tucked away in a corner. It is reserved for the elect, to be sure—they being teachers, visitors, and the like—but students may ride if they happen along when the elevator is going up. Programs are arranged to minimize the necessity for climbing stairs.

Up two flights and the elevator stops on the first floor. Here the Madison board of health has placed the clinic whose management they have recently taken over from the school board. The clinic was planned by one of the doctors in charge, who arranged it with the predominance of eye and tooth trouble in mind. There are four black-walled rooms for testing eyes, an operating room, a waiting room, and an attendant's room. There is no infirmary, but the model apartment in connection with the home economics department is arranged to care for all emergency cases.

The first rooms which the visitor sees on the second floor are the art department and the library—both large, well-fitted rooms.

The feminine world reigns unmolested on the second floor. Here is a spirit of busy domesticity and happy accomplishment that would charm a visitor even if the odors from the kitchen failed to do so. One marvels at the work of the other departments, but when it comes to a real thrill, it takes the culinary department to supply it. The cosy cafeteria is delightful even when it is not meal time. There is no wasted equipment here. Nothing was installed because it looked fine; everything was tested and as a result stoves, refrigerator (this has its own ice machine), electric potato masher, steam tables, water cooler, and all the other things that go to make an up-to-date cafeteria, test 100 per cent effective. Doilies and painted vases that are used on the tables were made in the art department, while the sewing girls are responsible for the unbleached muslin and cretonne curtains at the windows.

No attempt is made to serve the public in the school cafeteria and the students and teachers who eat there are given their meals almost at cost. The manager is allowed to make a small profit which goes into upkeep. Student help is employed. There is such an air of good-fellowship and the teachers enjoy the give-and-take so much with the students at meals, that so far there has been no response to the offer from the head of the department to arrange a private dining room for teachers. Increasing enrollment, however, will doubtless make this necessary soon.

A model apartment consisting of combination living and dining room, pantry, kitchen, bed room, bath room, and entrance hall is on the same floor with the cafeteria. This offers a problem in practical housekeeping for the home economics girls.

A laundry, adjacent to the apartment, is fitted with driers, stationery tubs, mangle, and electric washer. But as many of the girls come from, and will go to, homes where electric equipment cannot be had, instruction is also given in laundering with the more primitive galvanized iron tubs and "sad" irons.

In addition to the apartment kitchen, there is the regulation cooking laboratory which is fitted up with the best equipment that could be bought. All refrigeration is from a central ice machine and all garbage is disposed of in laboratory incinerators.

Two sewing rooms, each with its own fitting room, complete the second floor.

A little world of its own occupies the top floor. It is one of the strongest departments in the school and was organized and installed by the teacher in charge. Here are taught all the subjects bearing on commercial life. There is one room for teaching arithmetic and the use of calculating machines. Another houses the bookkeeping classes, another is the assembly

(Concluded on Page 145)



TENAFLY HIGH SCHOOL, TENAFLY, N. J. Ernest Sibley, Architect, Palisade.

Why I Prefer the Colonial Style

Ernest Sibley, A. I. A., Palisade, N. J.

Ruskin says, that "architecture is the art which so disposes and adorns the edifices raised by man for whatever uses, that the sight of them contributes to his mental health, power and pleasure."

It is not too much to say, that through the influence of the progressive school architect, there is developing among the laity, a careful distinction between architecture and building, as it relates to schools.

To build—to put together materials in units, and in a form to adequately serve any purpose, or house any activity, is not architecture. And architecture, so-called, ceases to be one of the fine arts when it fails to contribute to a building, such character as will raise it above and beyond its common usage.

American architecture really begins for us with the so-called Colonial style—and when we adapt this style to our school buildings, we link America's most noble institution with the spirit and traditions of the past, while history, and this most permanent and all-embracing of the arts, are thus most intimately united.

Eberlein in his "Architecture of Colonial America" says, "We have a history of which we may well feel proud—and we have an architectural heritage, dating from that time when history was in the making, which we may view with deep and just satisfaction."

And when we have created a school building embodying this style which is so essentially American, I could wish that every student within its walls might be taught the historical

background of its architecture, and thus create a fuller understanding and appreciation of that heritage.

The use of the style does not prevent originality, but rather does the individual use of detail and motif produce interesting examples of the true Colonial style, and thus adds another link in the chain of history and tradition.

Besides being of American origin, the Colonial is perhaps that style most common to all America—especially eastern America.

It has the qualities of simplicity and dignity toward which we try to influence our Youth, for the critic asks of any work of permanence—not that it be novel or effective,—but that it shall be fine and noble, having an eternal rather than a momentary quality.

The colorful effect of the Colonial red brick and white trim, has a charm that is irresistible, its beauty always being accentuated by the setting which summer affords, but never lost when the building must depend for its appeal, upon its color, mass, proportion and perfection of detail.

The Colonial style invariably commands the admiration of the laymen—that great majority

VALUE OF BUSINESS MANAGER.

I firmly believe a business manager for the school board who understood conditions and devoted his time to the work could save the taxpayers considerable money. Business men who serve on the board, giving their services free, must give their best efforts to their own means of livelihood, and in many cases can not give sufficient time to the best welfare of school work. —Dr. Jennie Callfass, Omaha School Board.

on whose good will and understanding the public school must depend for its maintenance.

And right here may I express the sentiment, that insofar as is consistent with his art, the painter, the sculptor and the architect should create always within the limitation of popular acceptance and understanding.

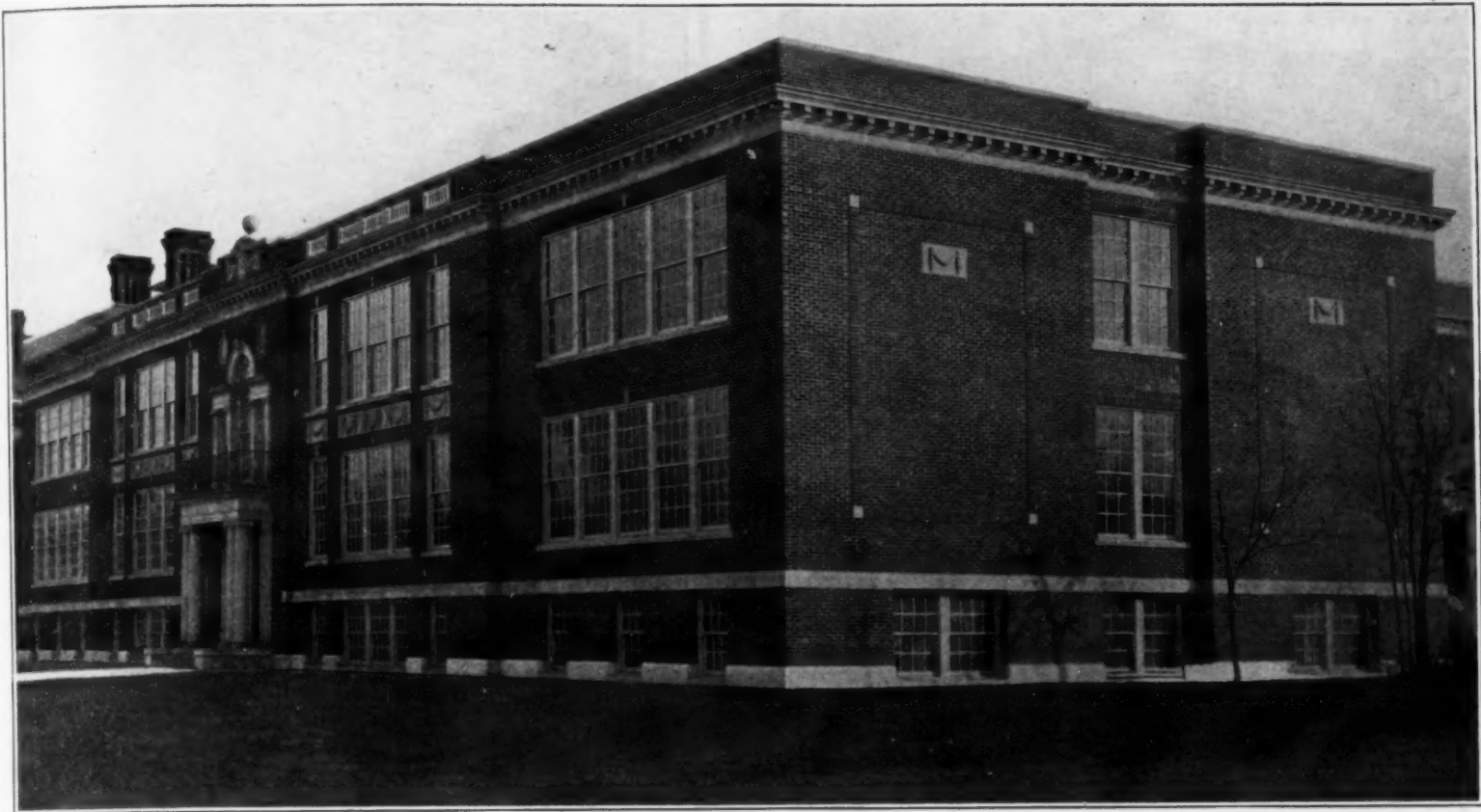
The style is equally appropriate for high or elementary schools—the former made more dignified and pretentious, perhaps, by use of the portico—while the latter may be beautifully enriched by the simple stoops and doorways of the Colonial.

And finally — I believe that the use of the Colonial style for school buildings, makes its strongest appeal to me through that peculiar charm—its domestic quality— which correlates the school with the home.

And this thought leads me to the vision of the hour—the public school that meets the need! For we cannot expect or demand blind allegiance to even so worthy an institution as the public school.

If we would attract toward it, we must not only create and develop an understanding of its advantages—for the individual, for the home and for the nation—but every public school must be designed to fulfill its highest mission—it must attract and influence by its beauty, and it must offer all the advantages and meet all the requirements of modern education.

Read before the Annual Convention of the National Association of Public School Business Officials, Atlantic City, N. J., May 18, 1922.



PATTERSON SCHOOL ADDITION, DAYTON, OHIO.

The School Building Program of Dayton, Ohio

Paul C. Stetson, Superintendent of Instruction

On April 27, 1920, the people of Dayton authorized a bond issue of \$3,000,000 for the erection of new school buildings and the repair and remodeling of old buildings. Due to the prohibitive cost of building, the actual work of construction was not started until 1921. The board of education authorized architects to draw the plans for the erection of a new junior and senior high school and two new grade buildings. They then decided to have their own construction department draw the plans and supervise the erection of the additions to the old buildings which they intended to have enlarged.

The following article will be an attempt to describe the interesting features of this work. The largest building to be erected by the board of education, namely, the Roosevelt high school, which will accommodate 2,000 pupils and will be a combined junior-senior high school, will be described in another article. This article will deal with the Jackson elementary school and the three additions planned and built by the construction department of the board of education.

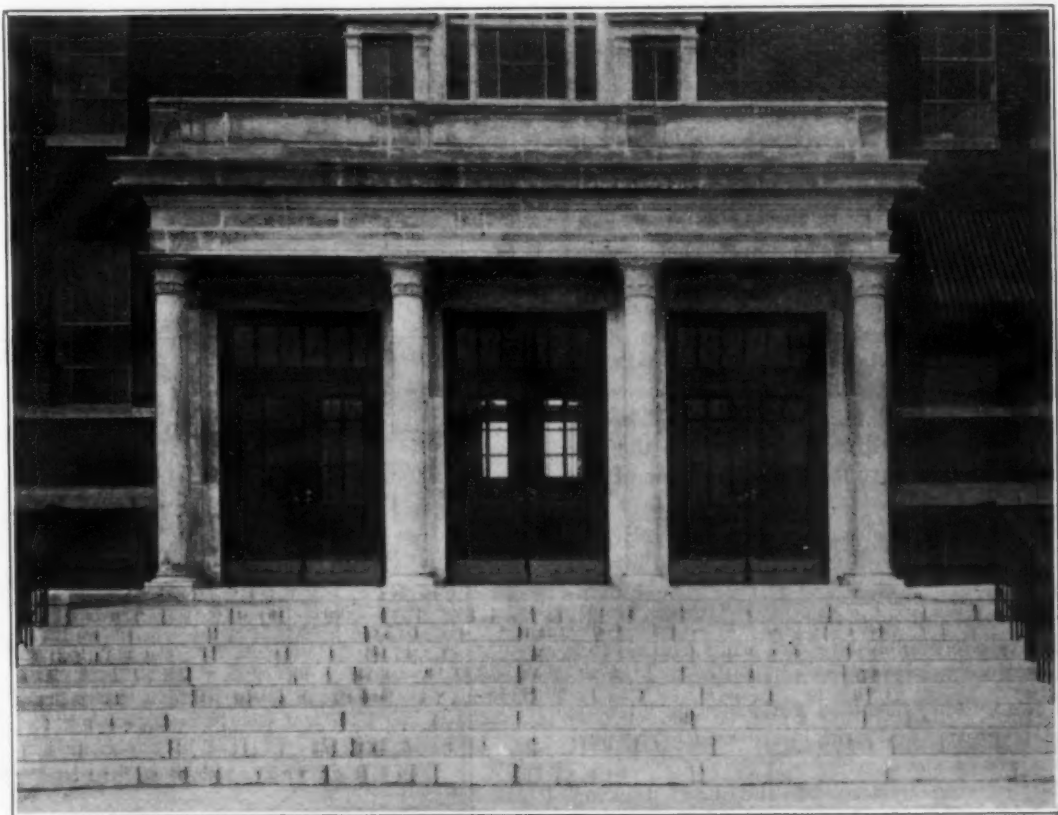
The Jackson elementary school is situated on the crest of a knoll in the center of a thirteen-acre tract of rolling land with a fringe of large forest trees, bordering an embankment that confines a small rivulet. The building dominates the site and the neighborhood. The frontage is east, thus insuring morning sun in all classrooms and protection from afternoon sun and also strong west winds.

The building contains eighteen standard classrooms, with a capacity of forty pupils each. All rooms are identical with unilateral light, blackboards on front and side, cork bulletin boards, with wardrobe and teacher's cabinet at the rear. In addition, there is one large kindergarten room with a spacious circular bay window. This room contains a fireplace, ample display and storage cases with glass doors, a

window seat with cupboards for toy storage underneath, a separate storage room for materials, a cloak room and a toilet room with a tiny closet, a lavatory and a drinking fountain. At the opposite end of the building, corresponding to the kindergarten, is located the room intended for a branch public library. This room also has circular bay window, a fireplace and a separate stairway to grade for use during times the building is not used for school sessions. An art room, fitted with a sink, a cement

floor in part, and zinc-lined storage cabinets, takes care of clay modeling, crafts work, etc. Two large store rooms are available for storage of books and supplies.

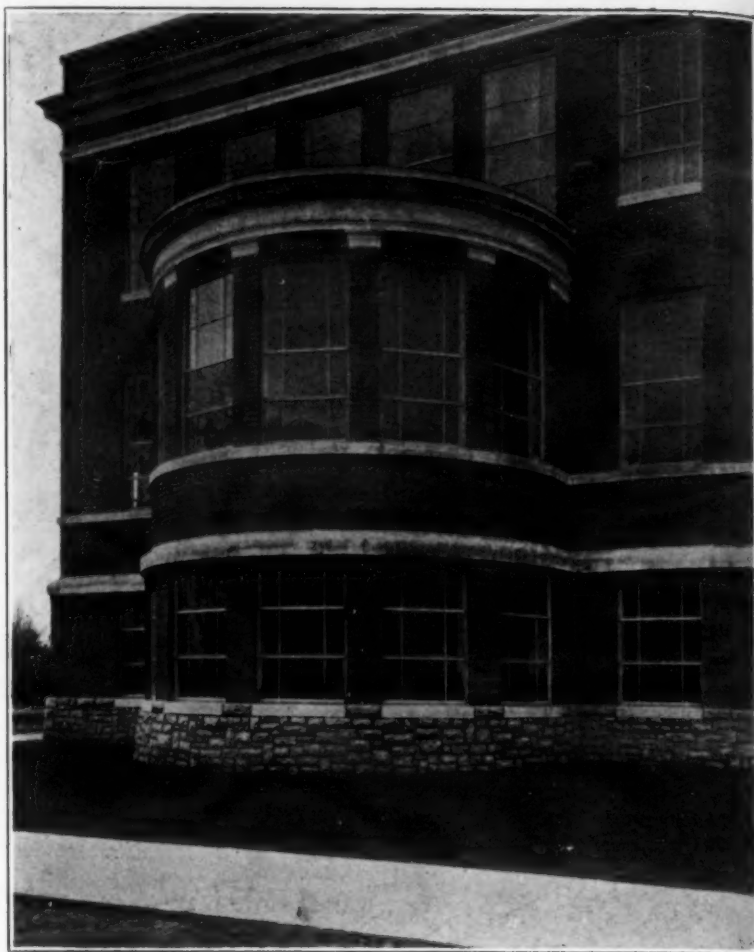
The principal's office, with a storage room and a private toilet and lobby, is located at the right of the main entrance. Rest rooms for both sexes with individual toilets are located on each floor, as prescribed by the Ohio State school building code. All corridors are eleven



MAIN ENTRANCE, JACKSON ELEMENTARY SCHOOL, DAYTON.
Gebhart & Schaefer, Architects, Dayton, Ohio.



DETAIL OF FRONT ENTRANCE, PATTERSON SCHOOL, DAYTON, OHIO.

KINDERGARTEN BAY, JACKSON ELEMENTARY SCHOOL, DAYTON, OHIO.
Gebhart & Schaefer, Architects.

feet wide and are well lighted and ventilated by windows.

In the basement story, which is set below grade only three feet, are located the shops and other interesting rooms, the manual training room for boys has a large storage room, a preparation and a paint storage closet adjacent. Adjoining is a room for drawing. At the opposite end are located the girls' sewing room, with fitting room and ample storage cabinets, divided into class sections, and a domestic science room. In this room are found space for a refrigerator, a storage pantry, hollow square cooking tables, a range, a separate water heater and outlets for electric and gas appliances. All basement instruction rooms have blackboards and bulletin boards.

An interesting feature of the basement is the fact that provision is made for a room specially designed for the carrying on of work in malnutrition. This room has a kitchenette and pantry adjacent with provision for the preparation of food.

Another interesting feature is the room planned particularly for parent-teacher association meetings. This room is located near the domestic science room and there are ample facilities for the serving of meals.

The gymnasium lies at a lower level, as it was found possible to save considerable expense in excavation by utilizing the hillside. The arrangement gives a direct grade exit to the athletic field which is one of the features of the architect's plan.

All corridors are wainscoted with vitrified brick in light buff tints. This is true also of all toilet rooms, locker and shower rooms, manual training and domestic science rooms. The stairways are enclosed in fire walls, with brick wainscoting and wrought-iron railings.

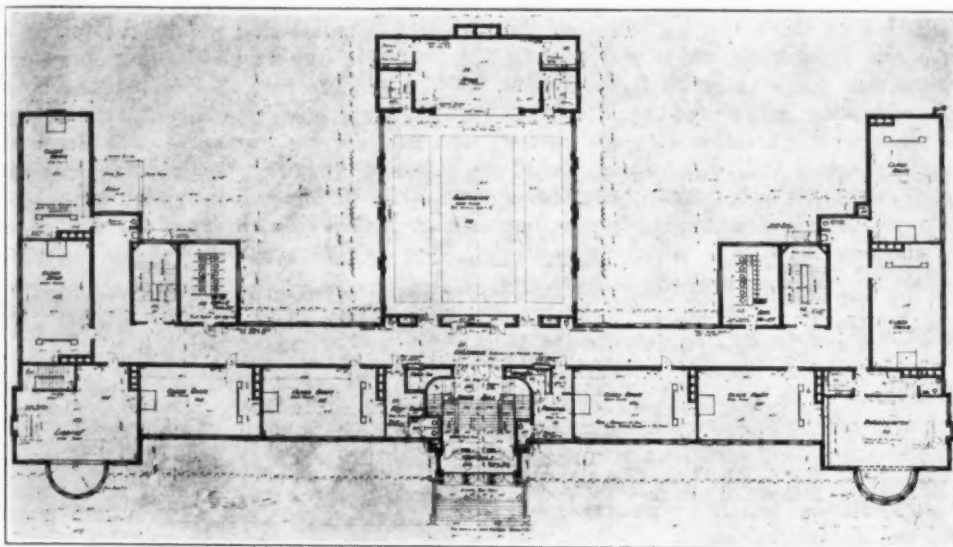
In the toilets suspended water closets, vitreous china lavatories and urinals are used. The partitions are of steel.

The heating system of the new Jackson School is what is known as "split steam" vacuum vapor system. All rooms have direct

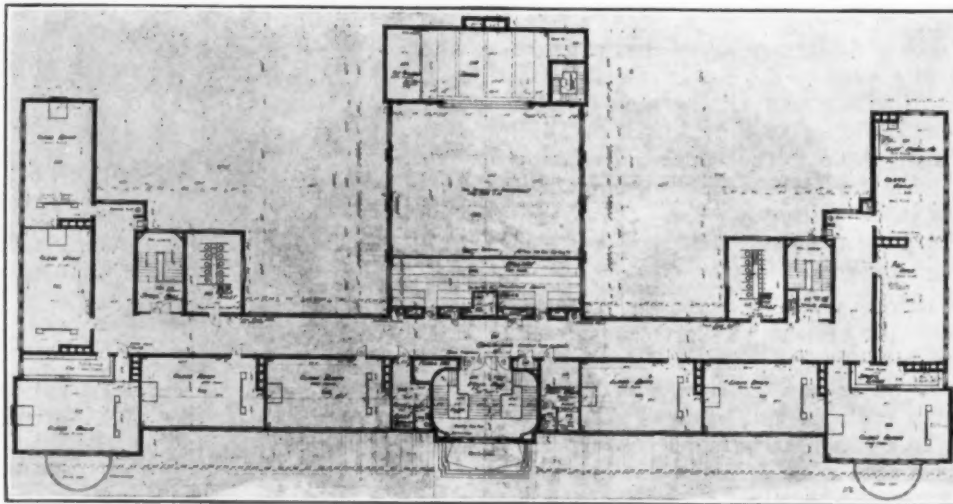
wall radiators under the windows, thermostatically controlled. Each tier of three rooms has a separate plenum-stack chamber, with a reheater thermostatically controlled, which gives a flexible system of heating. This is necessary

because of the exposed location of the building. Duct thermostats and air-controlled dampers permit heat distribution as conditions demand. There is also a duplex vacuum pump.

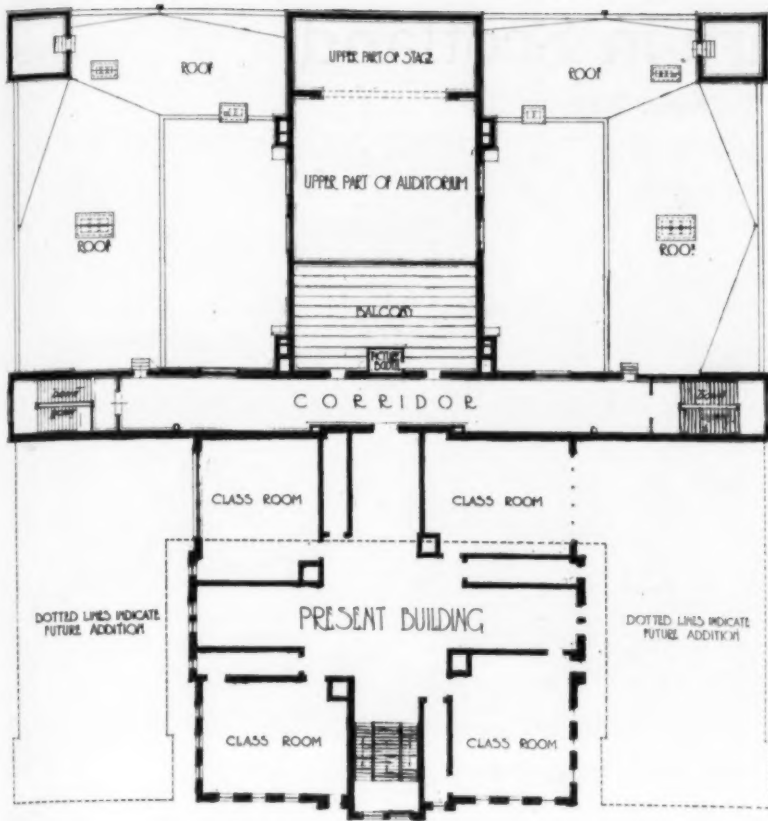
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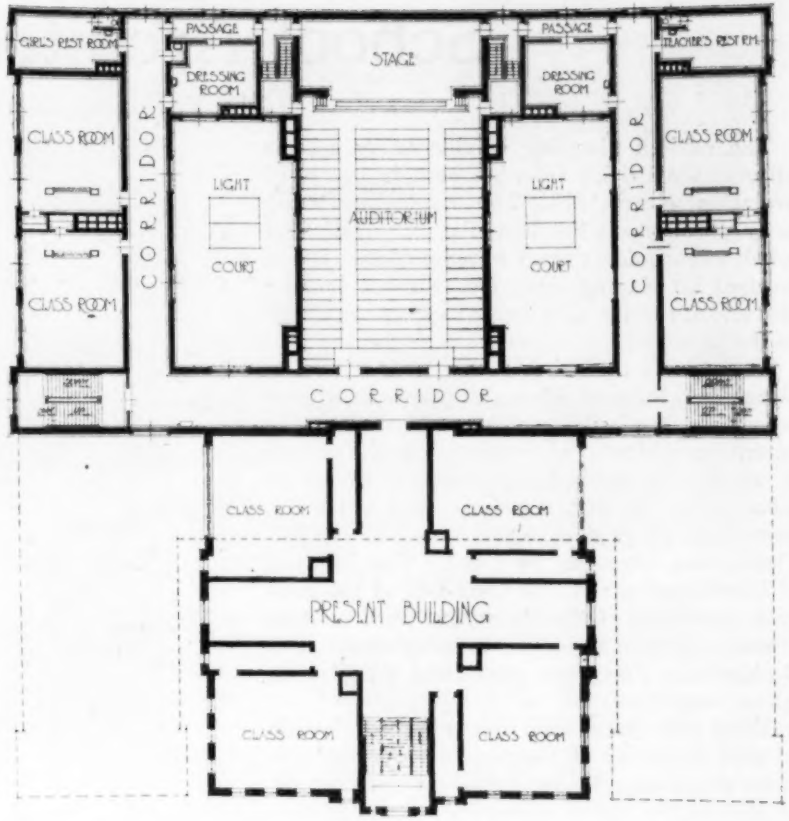
FIRST FLOOR PLAN, JACKSON ELEMENTARY SCHOOL, DAYTON, OHIO.



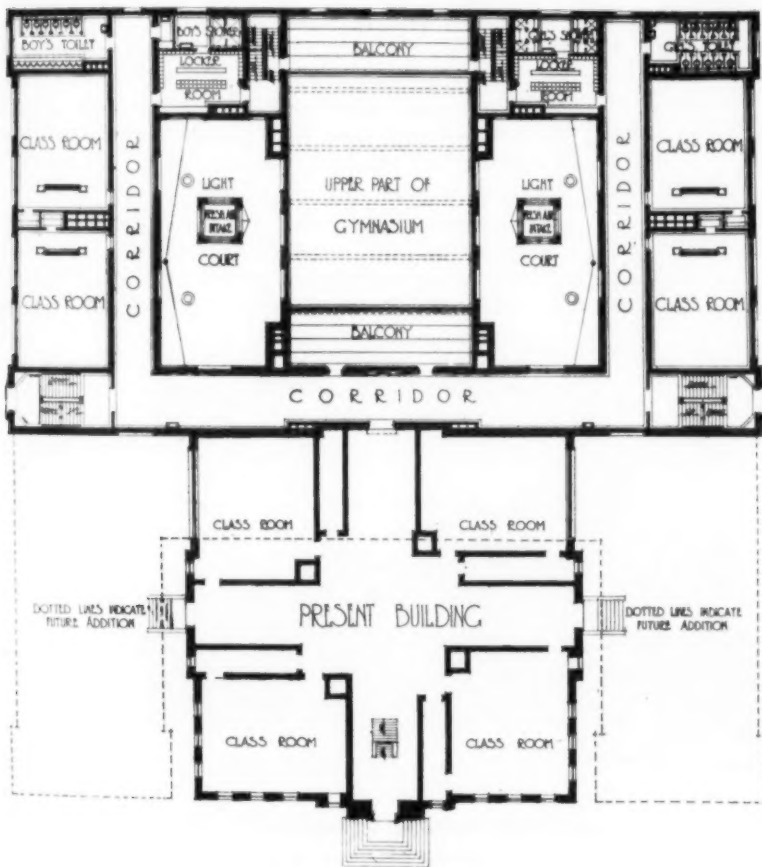
SECOND FLOOR PLAN, JACKSON ELEMENTARY SCHOOL, DAYTON, OHIO.



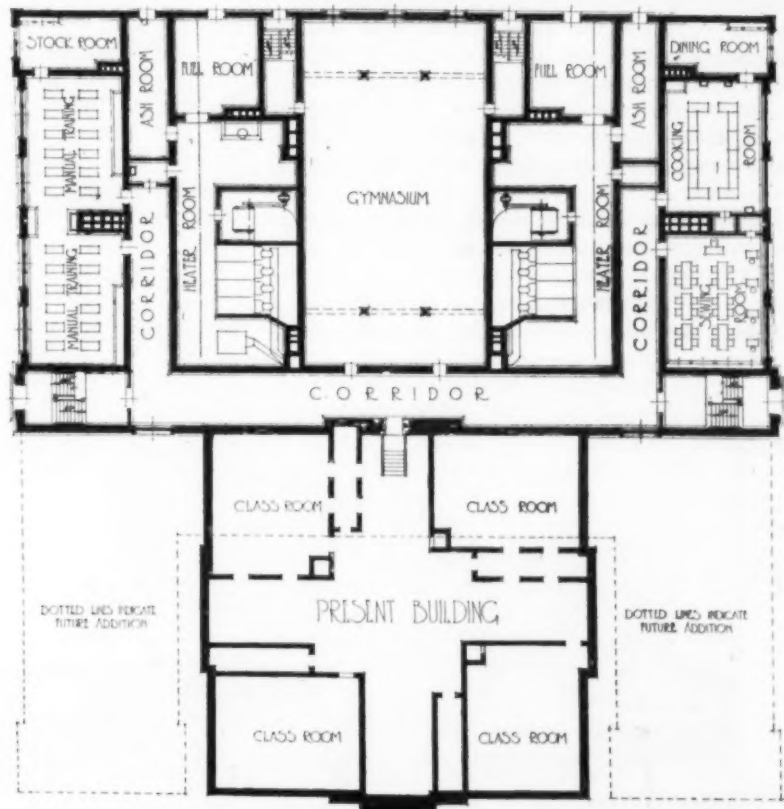
THIRD FLOOR PLAN
SCALE 1/8" = 1'-0"



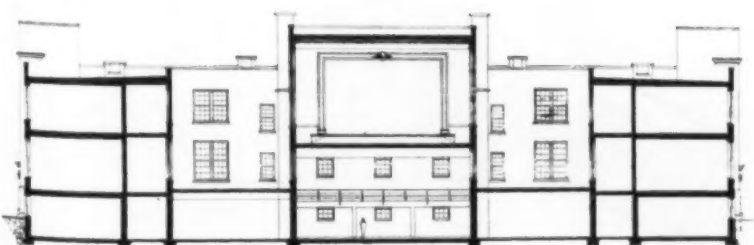
SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"



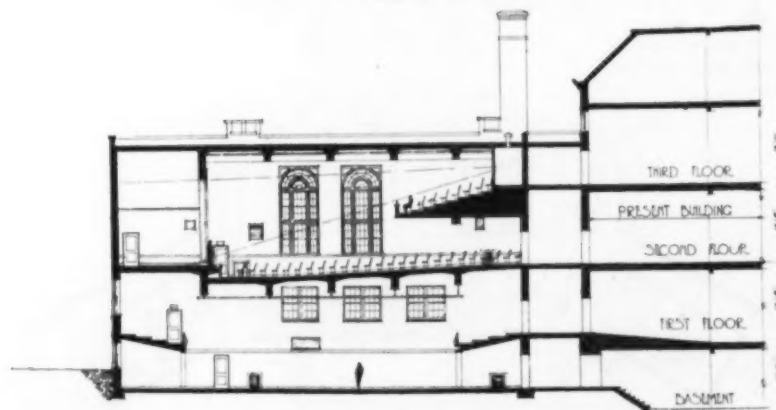
FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"



BASEMENT FLOOR PLAN
SCALE 1/8" = 1'-0"



LONGITUDINAL SECTION



CROSS SECTION

FLOOR PLANS OF THE HUFFMAN SCHOOL ADDITION, DAYTON, OHIO.
Designed by and constructed under the supervision of the Construction Department of the Board of Education.

School Architecture in Scotland

John Y. Dunlop, Greenfield, Tollcross, Glasgow.

The modern planning of elementary schools all over the British Isles has been in course of evolution since 1810. The most interesting early development has been the introduction of a hall in each department so planned that it can be used for singing, drill, etc., without causing disturbance to the classrooms in close proximity to the hall.

In the early seventies there was little professional knowledge of the requirements of a good school and the building rules prescribed by the education code were as elementary as the schools to which they applied. One serious defect in schoolhouses at that time was that the staircases were long, steep, narrow and ill lighted. Cloakrooms were not provided. The lighting of classrooms was chiefly from behind the children, and most of the classrooms were used as a means of communication to other classrooms. Besides, the sites were small and the playing spaces inadequate.

About the year 1890 many school boards adopted the policy of planning schools with separate classrooms to accommodate sixty pupils as against the eighty allowed by the education code. At this time also the education department increased the floor area in senior classrooms from nine square feet to ten square feet per child. The basis of school planning from that year on provided for senior classrooms with accommodations for sixty pupils and with a minimum area of ten square feet per child.

Introducing Central Corridors.

Various education authorities about this time built schools which lent themselves to the arrangement of separate classrooms and a central hall, and the experience gained with these schoolhouses pointed to the desirability of having more rooms around the hall.

Experiments were accordingly made in the direction of classrooms arranged on each side of a central corridor running the whole length of

the buildings. Then followed the three-story school, planned with halls for the three departments of the elementary school.

In 1891, the education department recognized the desirability of recommending that the local government boards authorize additional loans for new buildings on the basis of one pound per square foot of the hall floor space. With this concession, the school boards provided halls in all new elementary school buildings. School boards then began to build schoolhouses in which left-hand lighting was provided in the classrooms, and this is now regarded as essential.

Disconnecting Halls from Classrooms

The general characteristic of schoolhouses which have been erected during the last few

years of the old school boards, may be described as compact in planning the hall. In fact, the hall was used as a means of communication with the classrooms and corridors were avoided as far as possible.

About 1919, various educational authorities in the country were desirous of planning the halls so that their use for singing and drill would not disturb the work in the adjoining classrooms, and with this object in mind, schoolhouses were built in which no classrooms opened off the hall.

The board of education supported this view in respect to planning elementary school buildings, and in their regulations of 1914 urged that the hall should be so placed as not to disturb the work of the classrooms, and that, from a



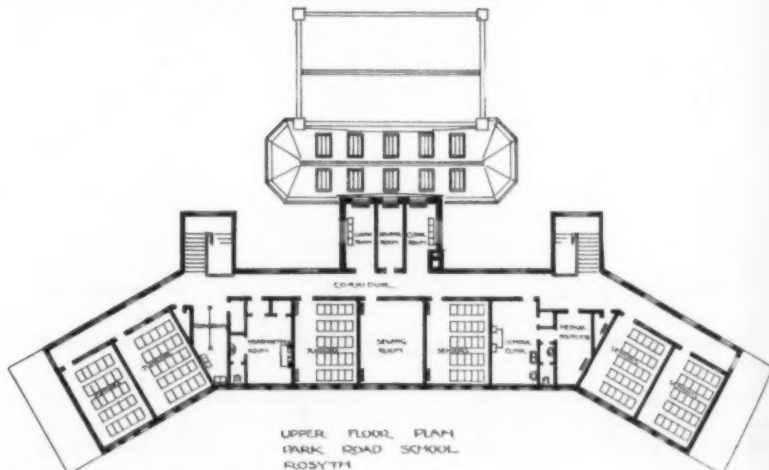
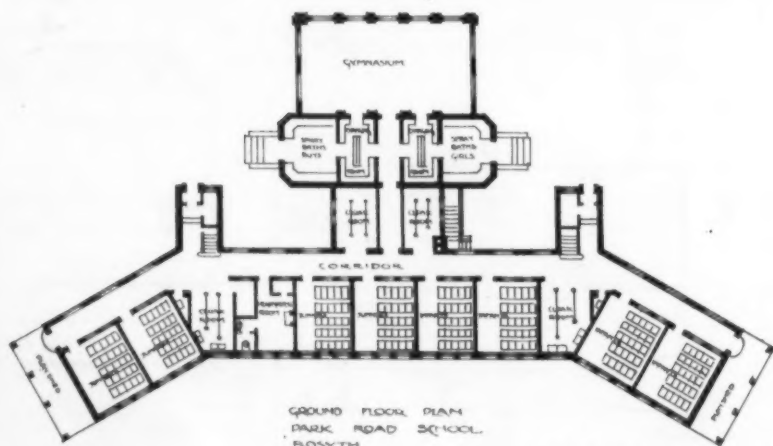
PARK ROAD SCHOOL, ROSYTH, SCOTLAND.



DETAIL OF PARK ROAD SCHOOL, SHOWING PLAY SHED.



SIDE VIEW, PARK ROAD SCHOOL.



FLOOR PLANS OF PARK ROAD SCHOOL. Mr. R. H. Motion, Architect.



GYMNASIUM, PARK ROAD SCHOOL, ROSYTH.



BOYS' ENTRANCE, PARK ROAD SCHOOL.

point of view of ventilation and freedom from dust, classrooms should not open directly from the hall. At the same time, more careful consideration was given to the aspect of the classrooms, with the object of securing access of direct sunlight.

Teachers' rooms were also provided on the general floor level and not on mezzanine floors. In addition, provision was made for alternate means of exits of all departments.

A further development in recent years is the provision in boys' and girls' departments of practical work rooms, in which elementary instruction in science, woodwork and needlework is given.

Fifty Pupils to Classroom.

All new school buildings are now being planned to give effect to the new agreement of fifty pupils in each classroom, and a number of old schools have been remodeled on these lines. The new school at Park Road Rosyth, designed by Mr. R. H. Motion, architect of Dumfermline, has been built with a maximum accommodation in each classroom of fifty pupils. The school which serves for both boys and girls accommodates 700 pupils. A gymnasium has also been provided, with a changing room and spray baths adjoining.

Special attention has been given to the ventilation of the classrooms. A ventilation duct runs the full length of the ground and first-floor corridors, and gives cross ventilation to each room.

The exterior is of simple design, built of brick, rough cast with stone base and dressings to the entrances. The building is heated with low pressure hot water system, and is electrically lighted. The site covers two and one-half acres, and leaves ample space for playgrounds and school gardens. This is one of our most recently erected schools, and when fully completed will cost nearly \$70,000.

We are badly in need of a cheaper type of schoolhouse all over Britain. Many school authorities are faced with a demand for increased accommodations, and at the same time are compelled to economize in building construction. They have been forced in many instances to construct temporary and semi-permanent buildings in place of the "last forever schools," so common in this country. And yet the emergency buildings are deemed by many people a great improvement on the old type of building.

Conservative Building Policies.

The critics of the former schoolhouse building policy maintained by the educational authorities are not many. But, as recent as 1910 a prominent London educationist told an audience in Glasgow that after visiting a Dumfermline school which had cost \$100,000 to build (a large sum at that time), she thought that the money would have been better spent in washing the children in the school.

This statement illustrates the point of view of those who contend that the school authorities in England spend too much on buildings as compared with the amount directly expended on educational service and on the welfare of the children.

Most authorities in this country have at one time or other adopted standard school plans, which reflect the then current ideas on education. In education as in other things, a continual development is taking place. New ideas, however, cannot always be conveniently put into

effect in "standard" building designs made to suit an educational system which has long been discarded.

The desire for adjusting buildings to new education policies, has brought about a tendency for a better use of light and for semi-permanent buildings, which may easily lend themselves to alterations or reconstruction to suit changed ideals.

There are those who believe that the better class of hut building erected during the war, is perfectly suitable, since the necessary structural alterations can be made without difficulty in a short time.

There is reason to believe that the shortage of school accommodations, together with the meager funds at the command of the school authorities, will bring about the evolution of a new, better and cheaper type of school building.

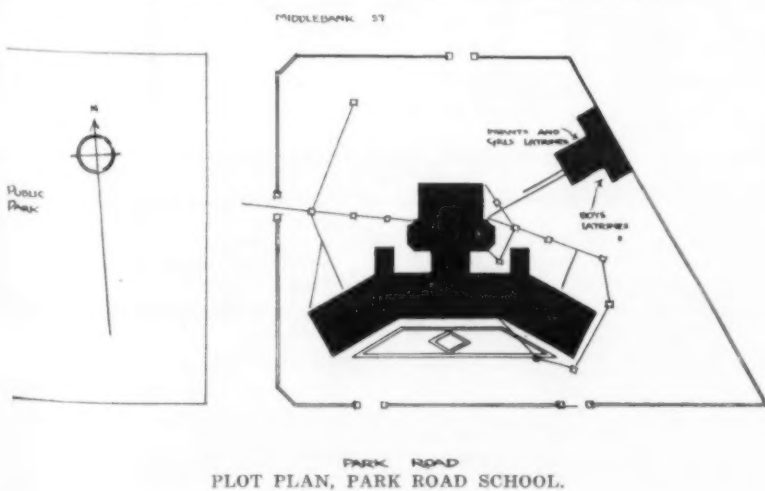
There is certainly room for such improvement, as the present type of stone fabric is much too costly and many of the old schools now in use in Scotland are beyond repair, and at the same time unfit for occupation by children.

CHATS DURING RECESS.

Superintendent Scott of Louisville, Ky., in making the point that teachers do not guard their health sufficiently, tells this one: A psychologist attempted to name the professions of people in the audience by looking at their physical appearance. He pointed to one and said: "You are a teacher." "No," replied the man, "I've just been sick."



SECTIONS, PARK ROAD SCHOOL.





ROOSEVELT JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.
Alexander Merchant, Architect, New Brunswick.

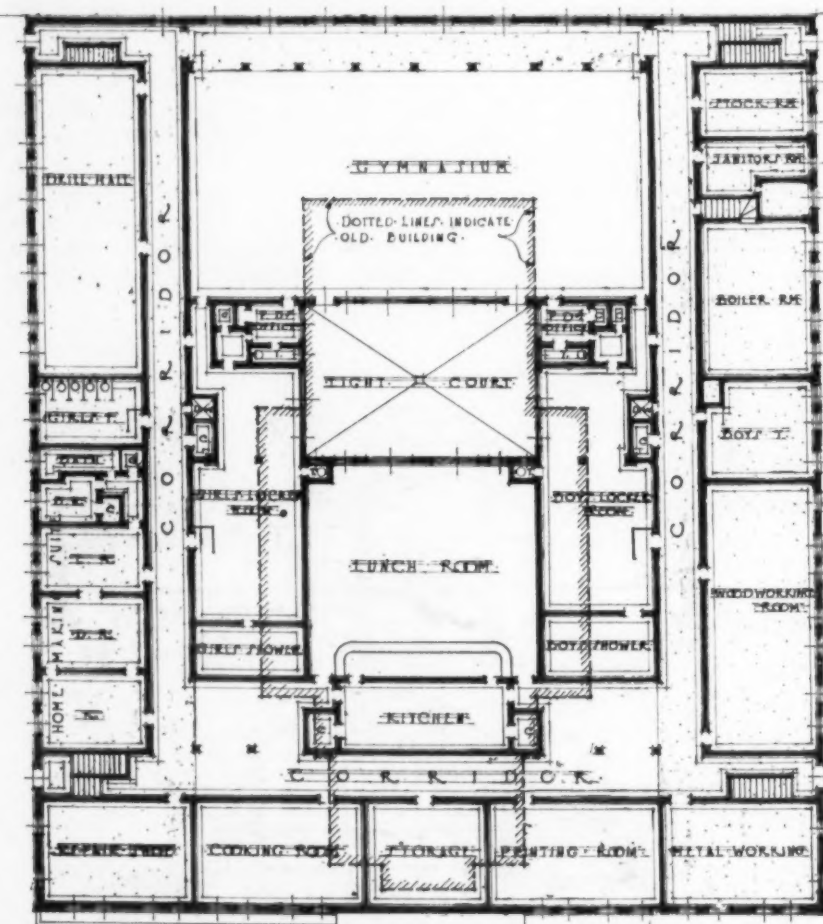
ROOSEVELT JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.

The Roosevelt Junior High School is a most interesting building not only in the facilities which it provides for a complete junior high school course but also in the manner in which it was designed and erected. The building was erected on the site and around the old Livingston school, one of the old grade school buildings of New Brunswick. The building was

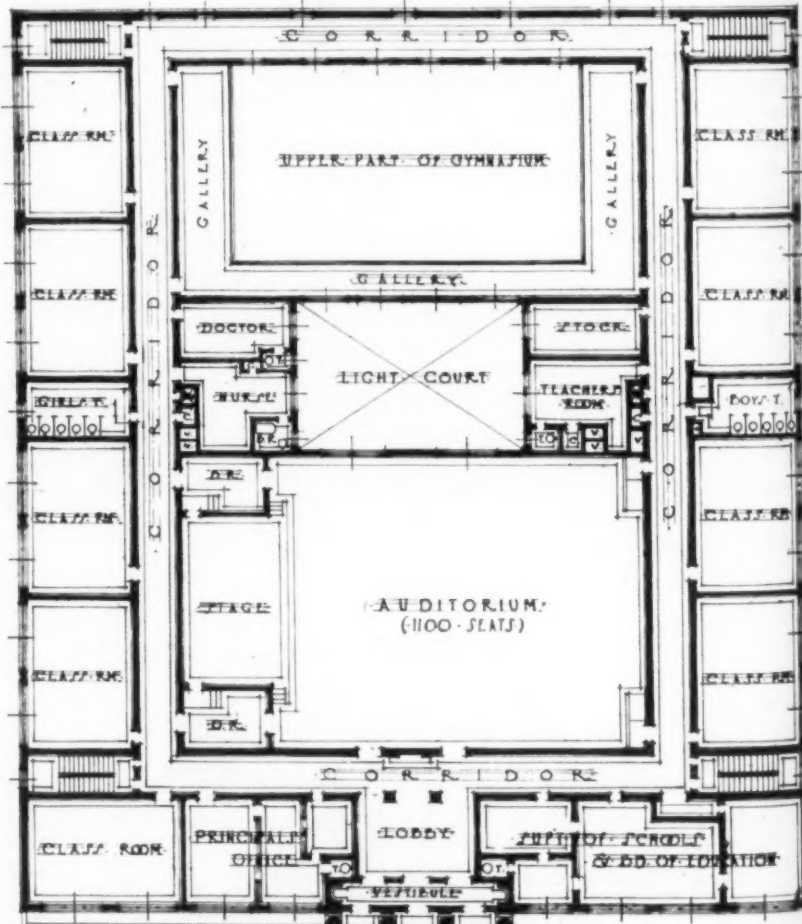
erected in two sections. The sides and rear were constructed first in such a manner that study could be carried on in the old building. As soon as the new structure was completed the classes were transferred to the new building and the old building was torn down. The center portion of the new building was then erected and the school was extended to occupy the entire building.

The building is of fireproof construction, ex-

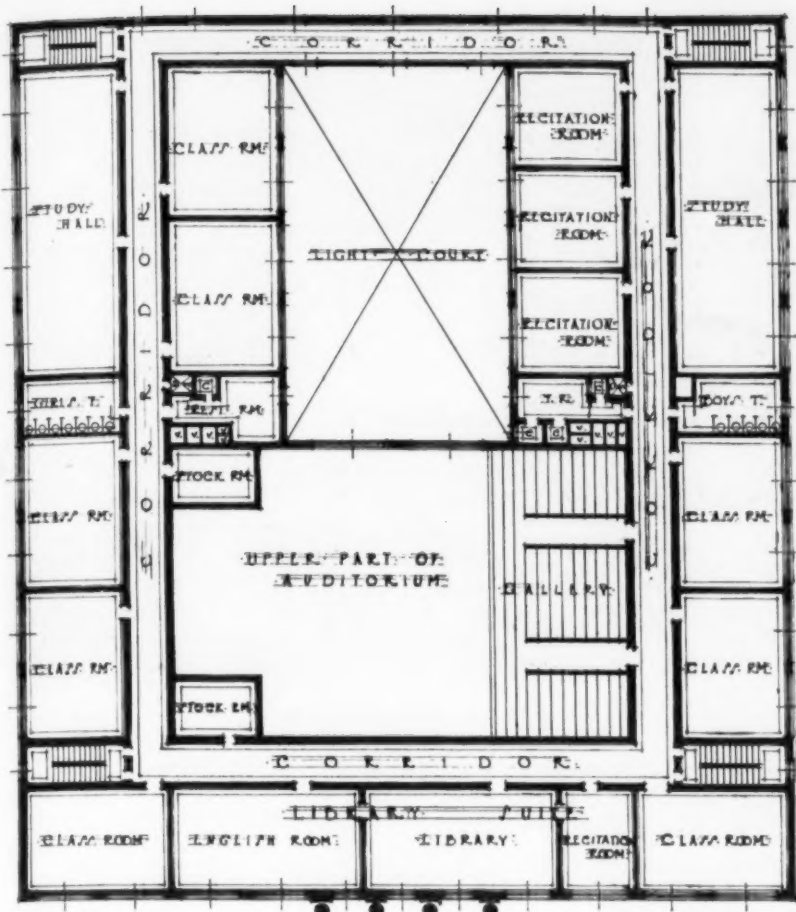
terior walls are of red tapestry brick with terra cotta and limestone trimmings. The front entrance approach is the main decorative feature, semi-circular in form, extending out from the main building. Several steps raise the broad platform, sixty feet wide, above the level of the side walk. The floor of this platform is treated with a red brick field laid herringbone pattern with granite borders. From this platform, by broad steps, we reach the level of the lobby.



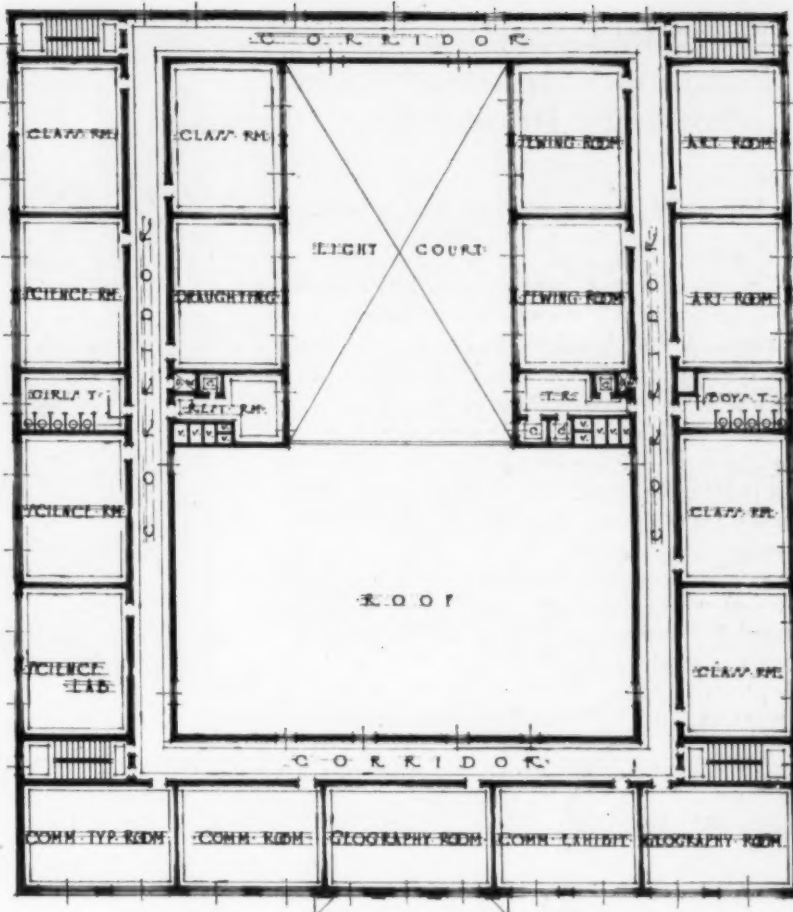
BASEMENT PLAN, JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.
Alexander Merchant, Architect, New Brunswick.



FIRST FLOOR PLAN, JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.
Alexander Merchant, Architect, New Brunswick.



SECOND FLOOR PLAN, JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.
Alexander Merchant, Architect, New Brunswick.



THIRD FLOOR PLAN, JUNIOR HIGH SCHOOL, NEW BRUNSWICK, N. J.
Alexander Merchant, Architect, New Brunswick.

The main entrance consists of three openings, the center has limestone trim on which is mounted a cartouche with the Seal of New Brunswick. The side entrances have limestone panels above in flat relief with symbols of education.

Entering we pass through a large vestibule to the lobby, with pilasters and columns as a feature of the decoration. The floor is terrazzo finish, with low marble wainscot. Approaching the front corridor from the lobby we mount several steps, the central portion of this corridor is treated similarly to the lobby. The corridor extends entirely around the interior of the building. At the extreme corners of the corridor are four fireproof staircases, entirely enclosed, which lead from basement to top story and have exits on Redmond and Welton Streets. All the rooms throughout are entered from this corridor, there being no small corridors or blind alleys.

The first story contains 10 classrooms, principal's office, anti-rooms, superintendent's office, board room, doctor's room, nurse's room, which is equipped with a bath room, teachers' room, stock rooms, and large toilets conveniently located, equipped with the most modern plumbing. On this floor, adjoining the main corridor is the orchestra level of the large auditorium, finished with a sloping floor, seating 750 on the main floor and 375 in the balcony. The stage is 23x35 feet and is equipped with the latest lighting devices. Dressing rooms adjoining on the sides.

The auditorium is decorated in the Adams style and is lighted from the side, as well as sky-lights overhead.

The second floor contains 12 regular class rooms, two large study rooms, each the size of two classrooms, library and English rooms, stock rooms, rest room, men teachers' room and the balcony of the auditorium.

The third floor contains 17 regular classrooms, stock rooms, etc.

All floors, including basement, are equipped with large light and airy toilets.

The greater part of the basement is above the street level, due to the steep grade of the adjoining streets. Here are located the sewing room,

cooking room, print shop, sheet metal room, woodworking room, drill hall, play courts where children can congregate before school in inclement weather. Off these courts is located the lunch room, 45 feet square, well lighted from and connected to an open air court which could be used in good weather. The kitchen is planned in connection therewith for a quick and efficient service. The Domestic Science Suite consists of a model kitchen, dining room, bed room, living room, and bathroom, equipped with the latest type fixtures.

The main floor of the gymnasium measures 50'x95' extending across the center part of the building and is connected on either side to girls' and boy's locker rooms of ample size to accommodate all scholars with individual lockers. Off the locker rooms are the shower rooms with tile floors and walls. The male and female Physical Directors' rooms are so situated that they overlook the gymnasium and locker rooms, which is

a feature recognized by school authorities of vital importance.

The walls of the gymnasium are of light buff brick, a broad spectator's gallery extends around three sides and is entered from the main floor, also from the gymnasium by a spiral staircase.

The sub-basement contains the locker rooms, coal bunkers, electric transformer room, janitor's room, etc.

The building is heated by a modulating, thermostatically controlled heating system, three large locomotive type boilers supplying the necessary steam. The system was designed having the high cost of fuel in mind. The plant is so arranged that the gymnasium and auditorium (which are frequently used after regular school hours) can be controlled by separate valves, so that these rooms can be heated without wasting fuel on the balance of the building. Ventilating is by the Unit System.

(Concluded on Page 78)



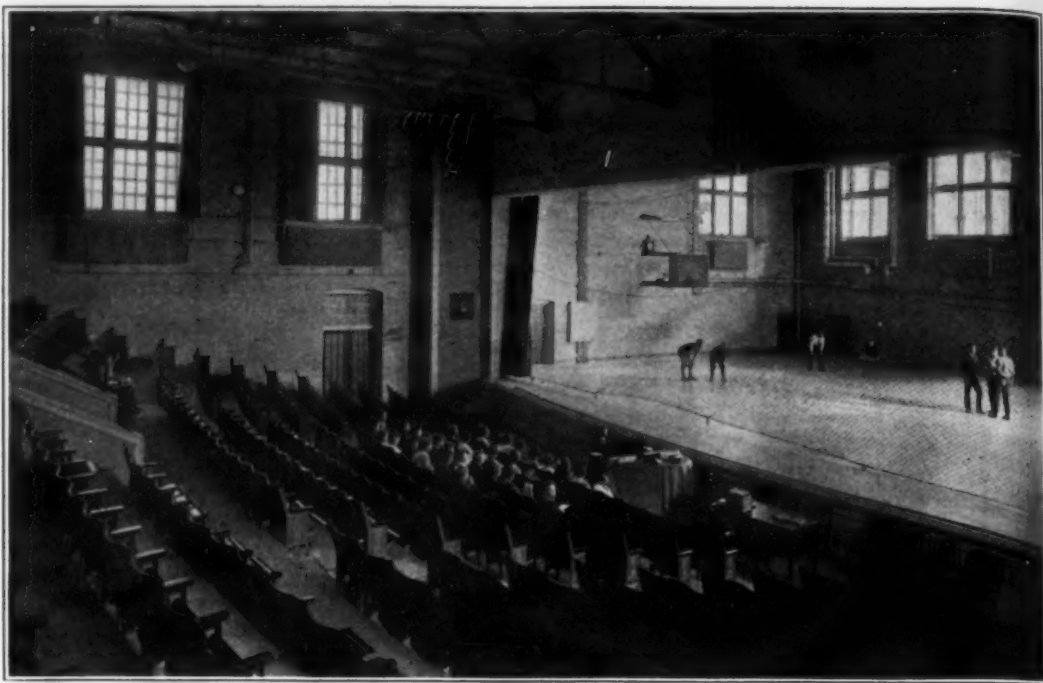
HIGH SCHOOL, OTTAWA, ILL.

The usual plan in making provision for spectators is the gallery arrangement. (See next page.)

Essential Considerations in Planning Gymnasiums and Pools for Present-Day Schools

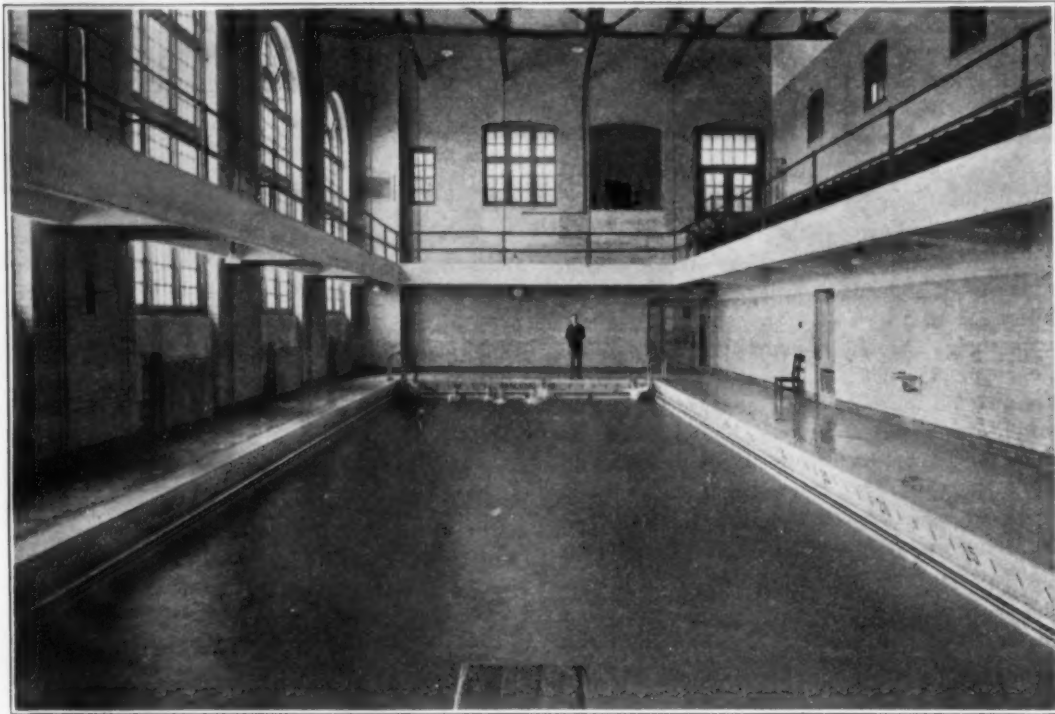
Wm. B. Ittner, Architect and School Specialist, St. Louis, Mo.

The planning of gymnasiums, showers and dressing rooms for schools is now becoming as common as the planning of class rooms. Even our elementary schools are including at least one gymnasium, which in some instances takes the form of a combination gymnasium-auditorium. Several of the larger elementary schools and practically all forward-looking Junior High schools are including two standard gymnasiums, a swimming-pool and the necessary accessory rooms. In large Senior High Schools two gymnasiums with accessories are always considered essential. The full development of the physical education and recreational activities of high school students is scarcely possible, with one gymnasium, unless it is of sufficient size so that



LINCOLN GRADE SCHOOL, ERIE, PA.

When the gymnasium is planned as an expanded stage, the whole auditorium may be used for spectators.



EAST HIGH SCHOOL, ERIE, PA.

If swimming pools are to constitute distinct assets to the physical education equipment, they must be well lighted and ventilated and installed under the strictest rules for sanitation and safety. It is scientifically possible for the pool to be thoroughly sanitary and hygienic if the essentials regarding installation, administration and upkeep are given the necessary consideration.

it can be divided by means of a portable partition into two gymnasiums.

Experience has proved that 50x80 feet is a normal floor-space for gymnasiums, although 60 x90 feet are more desirable dimensions. The height should not be less than 18 feet under beams and trusses.

The unvarying requirements to successful gymnasiums are maximum light and ventilation. The gymnasium floor must therefore always be above grade. The plans of a large number of recent schools, show the floor on a level with the auditorium stage. In fact, by such an arrangement the gymnasium becomes an expansion of the stage. This stage-gymnasium has several advantages which are now quite well understood.

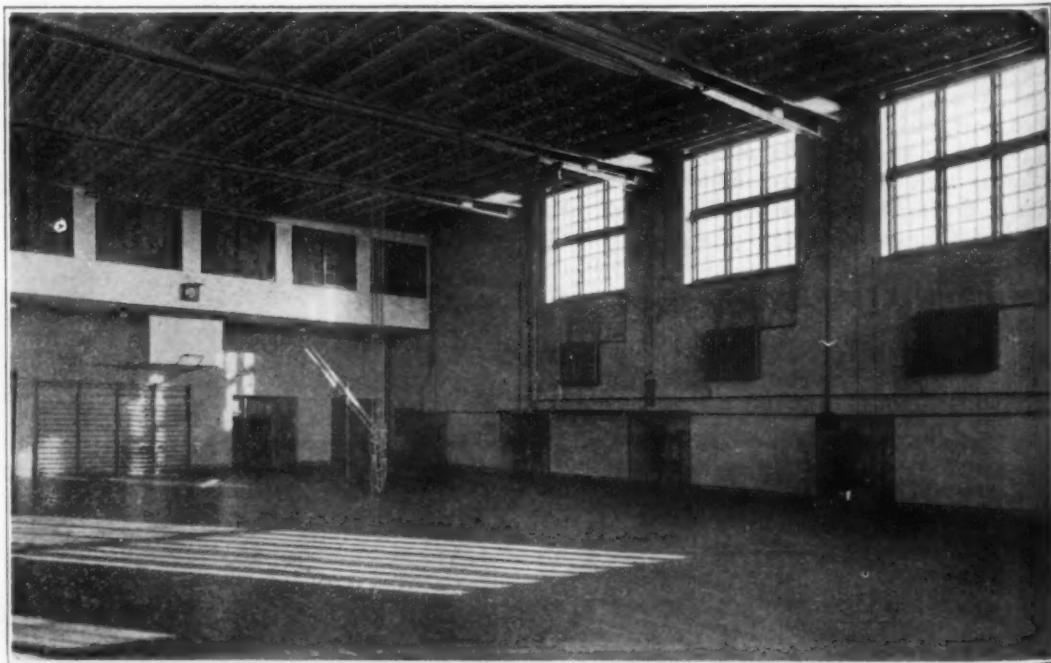
The minimum standard size for swimming pools is 21x60 feet with adequate head room for diving at the deep end of the pool. Like gymnasiums, pools must be properly lighted and ventilated or they can not in reality constitute valuable additions to the physical education quarters. A sunlit pool, with proper and adequate systems of water circulation, refiltration, purification and heating adds materially to the interest of the

physical education activities and constitutes also, a distinct community asset.

The number of showers, lockers, and dressing rooms for boys and girls is wholly dependent on the number of students to be accommodated each period in the gymnasium and pools. For this reason, the problem is an individual one for each school. Usually ten showers are sufficient for a class of 50 boys. But more are required for girls.

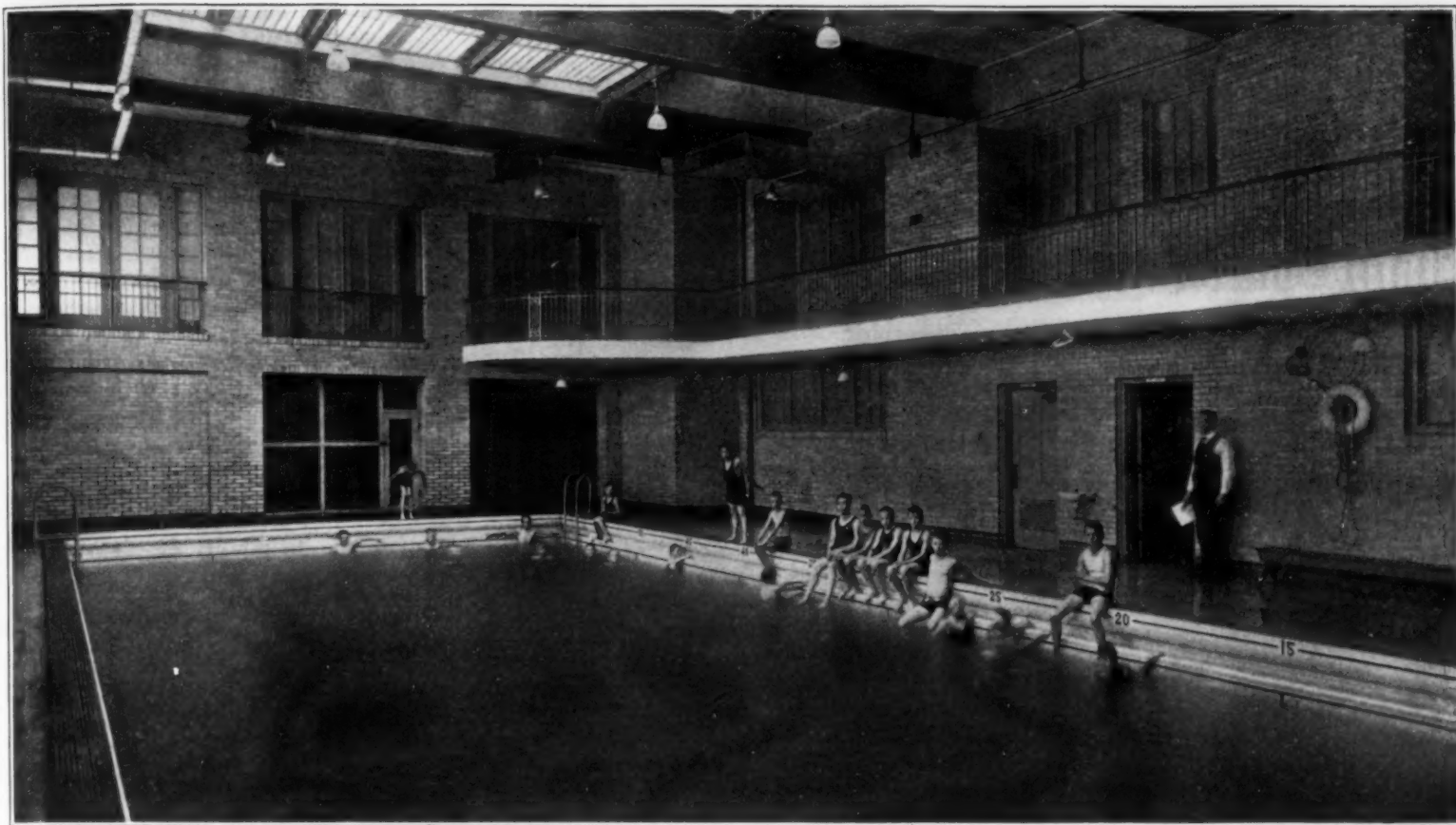
Provision for spectators is a desirable addition to gymnasiums and pools. This may be secured by several methods: (1) where two gymnasiums are separated by a movable partition, one of the rooms may be arranged with a lifting tier of seats which may be lowered into place at any time. (2) The gallery arrangement with or without fixed seating is the usual provision. (3) Adjustable glass partitions opening from the second floor corridors into the gymnasiums constitute another method. (4) In schools where the stage-gymnasium is provided, the auditorium serves for spectators. For games such as basketball, portable bleachers may be placed along the sides of the gymnasium floor.

Just which plan is superior will depend on conditions and size and type of school. The lifting amphitheater can accommodate large num-



HIGH SCHOOL, SPRINGFIELD, ILL.

When the lifting amphitheater for spectators is not in use it is readily raised to the ceiling of the gymnasium.



ERIE ACADEMY HIGH SCHOOL, ERIE, PA.

Where side-lighting is not possible, pools may be successfully top-lighted. Pools may also be provided with spectators' galleries.

bers and can readily be raised out of the way when not actually in use. But it requires the double gymnasium divided by the folding partition. Both the gallery and the corridor arrangements are limited as to the number of observers they can accommodate. The auditorium in connection with the stage-gymnasium is the superior plan if accommodation for large numbers is the chief consideration. And its only disadvantage lies in the fact that observers at the rear do not get as clear a view as those near the front and center.

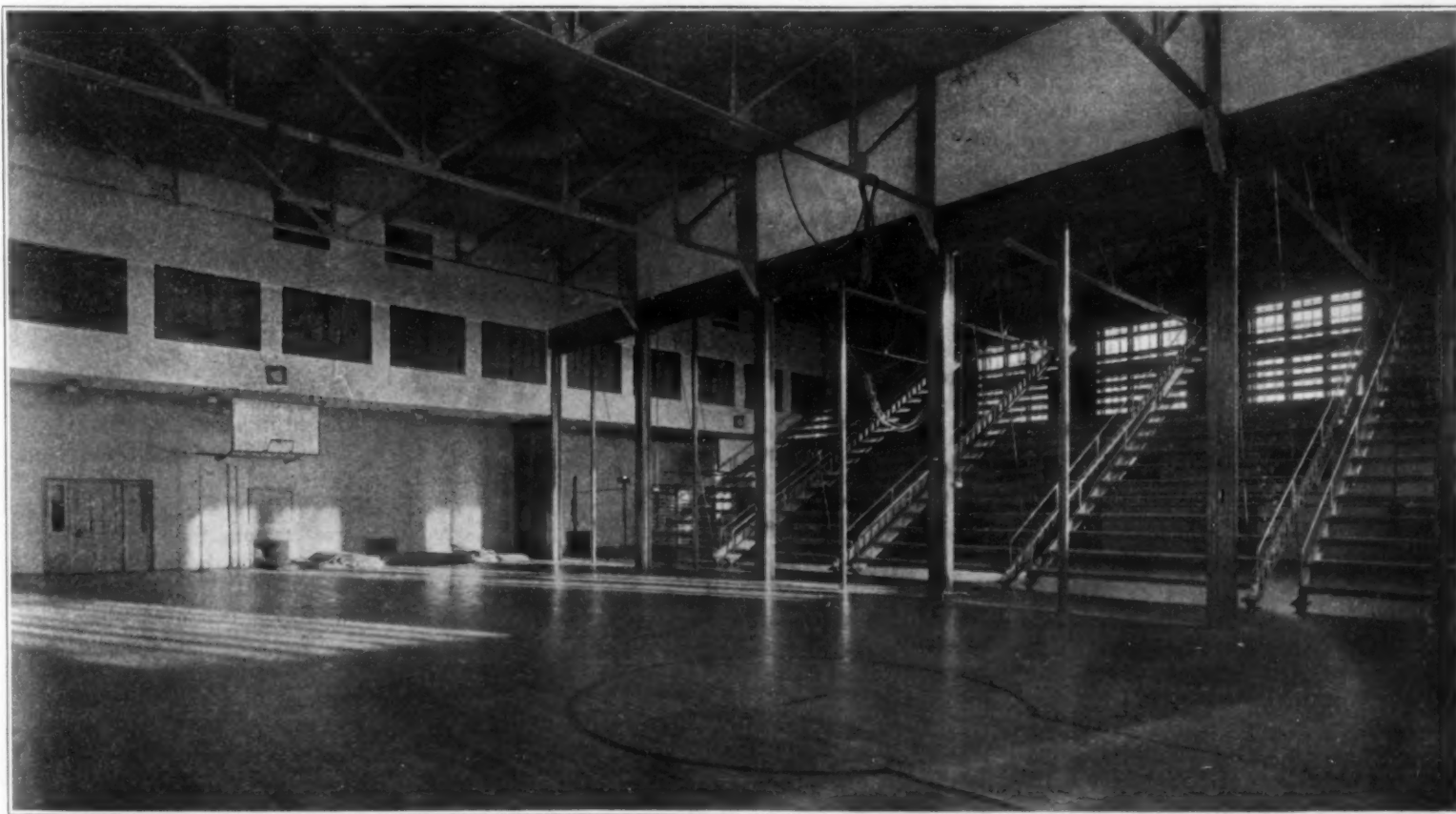
—The New York state commission on ventilation which conducted an investigation covering four years on the city schools concludes its report by saying that "either window ventilation or plenum fan ventilation—if the plant be properly designed and operated—yields general satisfactory results from the standpoint of air conditions in the average schoolroom. The main difference lies in the fact that the air of the fan-ventilated room is likely to be about two degrees F. higher, and more uniform in temperature, and that the air movement in this method is considerably greater."

—The Minneapolis, Minn., board of education has requested the board of estimates and taxation to issue bonds in the amount of \$2,420,000

for the acquisition of school sites and erection of new buildings, in accordance with its building program for 1923.

—The school board of Waycross, Ga., has adopted a five year program for the schools which involves an increased 10 mill tax. The board does not care to submit the financial question to a popular vote until the subject has been thoroughly agitated and the citizenship is thoroughly informed.

—Monessen, Pa. The school district, on November 7th, voted favorably on a bond issue of \$150,000 to be used for completing a new junior high school. The building which will cost about \$450,000 complete, will be ready for occupancy in September, 1923.



SPRINGFIELD HIGH SCHOOL, SPRINGFIELD, ILL.

In the case of two gymnasiums separated by a movable partition, one of them may be arranged with a lifting tier of seats which may be lowered into place at any time. This plan will accommodate a large number of observers.



THE AMERICAN School Board Journal

WM. GEO. BRUCE }
WM. C. BRUCE } Editors

EDITORIAL

AN ADMINISTRATIVE BALANCE WHEEL.

The administration of the American schools is characterized and distinguished from the school systems of other countries by decentralization. Every unit governs itself and centralized direction is exerted over smaller and scattered units only where this is obviously essential. Local authorities are in virtual control. The school board is that authority.

In contradistinction of the American system we may note the centralized control of the educational systems of the European countries. The minister of education here may sit at his desk, press a button and give his orders to the schools of an entire nation. He may know exactly what minute certain class recitations are undertaken and may change courses of study to suit his fancy and belief.

The decentralized method in vogue in this country is in greater conformity with the American spirit, hence, has become an accepted and permanent system. This fact, however, leads us to minimize some of the factors which attach to such a system. We do not care to enter into comparisons with other systems. We are satisfied with our own.

One of the factors is the board of education. While we regard it as an essential part of our system of popular education we are likely to overlook the larger aspects of that body in the part it plays in the American system. That is because it is always before us, and has, therefore, become a commonplace institution.

But, let us assume that the board of education is abolished. What would follow? Surely, autocracy in school government would be inevitable. If the school systems of foreign countries are conducted upon a centralized and autocratic basis it is because the local authority, representative of the general public, had not been thought of in the earlier stages of their establishment.

The schoolmaster is essentially a unit of authority. By virtue of his office he is, within his professional sphere, a finality. A pupil constituency must not doubt his knowledge or his judgment. In dispensing education his word must be accepted. Within certain limitations he is an autocrat. In the nature of things this must be so.

The board of education which stands between the schoolmaster and the general public plays an entirely different part. It typifies the democratic thought not only in that it serves in a representative capacity, but also that in its very being—scope and function—it breathes democracy and equality into the administration of the schools.

Thus, it also follows that in contradistinction to the school systems of Europe, the board of education of our own land is the most distinctively American part of our school government. It is the most outstanding factor which distinguishes a decentralized system from an

autocratic or inflexible system. Remove the board of education from the American system of popular education, and it is no longer American. It is Europeanized.

Those who serve on boards of education may be actuated by a consciousness of rendering a service in the cause of citizenship training, but they may also well become fired with the thought that the body upon which they serve as an institution has a meaning and a mission which is vital to the preservation of the American spirit and the perpetuity of the Republic in that spirit.

EDUCATORS RECOGNIZING INCOME TAXATION.

When the great momentum and expansion which the schools of the United States had attained came to a climax a year ago as the result of the inflation of costs and other abnormalities, the question of financial expedients and remedies came under serious consideration. These are still under consideration, and the discussions on how to raise more money still continue.

The SCHOOL BOARD JOURNAL, too, made a study of the subject and was the first to suggest and to champion the state-income tax as the most expedient, just and equitable instrument through which an increased school revenue was to be secured. In a series of articles on the American school taxation problem published in this Journal, it was clearly demonstrated that, if an increased support for the schools was found to be necessary, this support must come by means of new tax sources. The present tax sources are strained to their utmost and will not on the whole bear a greater strain without inviting strenuous resistance.

While we have championed the state income tax as being promising of a solution, we have also been conscious that we were dealing with an involved and unpopular subject and that it would be difficult to interest educators in the same.

Gradually, however, an educator here and there is coming to the realization that he cannot with good grace ask for more liberal school support without some thought as to where that support is to come from. The tax ability of every community, which is mainly based upon property valuations, has its limits.

State School Commissioner Enright of New Jersey recently said the following: "These are times of appalling expenditures. In fact, they are far beyond what anyone ever dreamed of, and it will be necessary to go further if the public schools of this state are to supply the children with that for which they are craving."

"The school tax of New Jersey is one-sixth of all the taxes collected, and the farmers are crying for relief. Last year the sum of \$36,000,000 was spent on our schools. Taxes have grown enormously, due to the fact that there are more pupils in the schools now than ever in the history of the state."

"We do not wonder that the taxpayers shudder at the expense, but it cannot be helped. How can the people stand for it? Had it not gone far enough? Realty is feeling it and every taxpayer is feeling it."

"A new method of taxation for schools should be found. What that method is I do not know, but, as it now stands, realty is paying for it all. In the Middle Ages there was no realty, but an income tax, an equal tax was paid to keep the government going."

Commissioner Enright has pictured the situation as it exists in his state, and is looking for relief. He is headed in the right direction. Let him enter the domain of taxation and he will soon learn that the present property tax is an inequitable and antiquated instrument. He will also learn that the principle of taxation, which

is based upon the ability to pay, is accepted by all tax students and is recognized by the leading countries of the world.

A well known platform educator has deemed a state income tax out of the question because there is already a national income tax, and that a national and state income tax simultaneously exacted means double taxation. This is nonsense. The various units of government, city, county, state and nation, exact a tax. Whether this be a property tax or an income tax does not alter the matter. All units might base their tax on property or all base the same upon income. The fact that you pay both, a local and a national tax, does not mean double taxation. Double taxation means to pay the same tax in the same unit twice.

The purpose of this editorial, however, is not so much for the purpose of discussing the relative merits of systems of taxation as it is to point to the desirability of educators who are concerned with the question of greater support for the schools to begin at the beginning, and to give some study to taxation as a prerequisite to that support.

COUNTY SCHOOL BOARD ASSOCIATIONS.

While state conventions of school board members have on the whole been somewhat spasmodic and periodic, the feasibility of county conventions has during the past year been demonstrated in some of the western states with more than ordinary success.

The utility of school board conventions, be they state or county, is no longer to be questioned. The state conventions have brought together school board members from the larger centers of population while the county meetings have drawn their support from the small villages and rural districts.

The experience with the latter has taught that the rural school director or trustee has greater need for the advantages that accrue from mutual counsel and discussion than the city official. In the nature of things these county gatherings become quite social in character and somewhat intimate as to problems and their solution in the light of concrete experience.

These gatherings have taught how to avoid the glib salesman of cure-all devices for educational ills, of securing uniformity in the purchase of modern supplies and standard prices. They have fostered a closer cooperation between school heads and the teaching forces to the end that greater efficiency as well as economy has been effected.

The importance of conducting the schools upon a business-like basis must still be argued in many rural school districts. While the school boards in the larger centers are made up of those experienced in business affairs, they also preside over school systems which are highly organized and where every detail is delegated to trained men.

A school system in the country may imply one school and one teacher where the relations of the school officer to the school is more intimate and requires greater immediate care at his hands. While the success of the school rests primarily upon the teacher, the trustee or director may, after all, make or unmake the school.

The well informed school director soon appreciates that there is a tendency to throw upon the teacher responsibilities which he himself ought to bear, and that the school grounds, the building and equipment and the general school paraphernalia require constant attention at his hands.

County school board associations have their value, too, in that the rural school needs, from a legislative point of view, may be discussed and formulated into definite forms of action. The

teaching forces may have well digested ideas as to remedial legislation and yet not desire to bring them into effective expression. The school director should not hesitate to weigh these ideas and to support them when the true interests of the schools are at stake.

Thus, county school board conventions not only have the power of stimulating greater enthusiasm and better understanding for the mission of the schools, and thus effect better housing and better teaching, but they may also win legislative recognition in determining the larger questions affecting real progress in rural education.

A TROUBLESOME CATCH PHRASE.

When some one cried "fads and frills" for the first time, some two decades ago, there was a great commotion throughout the country. The alliterative phrase proved attractive, and the public was impressed. Surely, the schools must be running wild on special studies! Music, drawing, calisthenics, and what not, had come into vogue, and a halt must be made.

But, what happened? When the objectors were asked whether they wanted the average child deprived of the cultural blessings afforded to the rich man's child, the answer was in the negative. When they were asked whether music, drawing and calisthenics were fads, the answer was in the negative. When finally the objectors were challenged to point out the specific fads and frills in the schools there was some astonishment, some hesitation, and then nothing but silence. The objectors were stunned by the very emptiness of their own catch phrase.

Occasionally, however, the cry of fads and frills is heard and is usually uttered by those who have but a remote knowledge of what the American schools are doing, and that what they are doing is done with the full knowledge and consent of a thoughtful and progressive citizenship.

When in Cincinnati, at the autumn election, the question of an added school levy came under consideration there were those who believed they could stampede the voter into a negative position by employing the old catch phrase of "fads and frills."

The Cincinnati Chamber of Commerce, constituted of hard-headed business men, studied the situation, and came to the rescue. "There are no so-called frills in our schools" was the dictum of that body. The extra money was needed to stem overcrowding, to continue the night schools, penny lunches, open air classes for anemic children, and to make needed school-house repairs. And the school levy won.

What occurred in Cincinnati may occur in any center of population where increased tax levies or bond issues for school purposes are under determination by popular vote. The average man is readily attracted by a catch phrase, which can best be refuted by a simple statement of facts.

The public schools as now conducted throughout the United States, will bear inspection and stand as a living proof against the thoughtless objectors whose only weapon is a well-worn catch phrase which is obsolete in the field of popular education.

WHY THE NATION'S CAPITAL IS BACKWARD.

With a startling candor the school authorities of Washington, D. C., tell why its school system is slow. In a report issued by the board of education the fundamental considerations, first, a well-defined educational program and second, adequate resources, are recognized. The capital city has lacked both. Changes in leadership prevented the one, and dilatory legislative tactics caused the other.

Here are some of the drawbacks that have been enumerated: The board rents fourteen different parcels of property for classroom purposes. It will require 71 classrooms to eliminate that many portables now in use and nineteen more classrooms to accommodate the part time pupils. Besides it would take 57 more classrooms to reduce overcrowded classes to a pupil attendance of forty each.

This was the situation in November, 1921. Since then the situation has been aggravated rather than relieved. The probabilities are that it will now require 140 classrooms, or seven new twenty-room buildings to properly house the school children.

But, the cause of the trouble lies with the manner and method of making school appropriations for the city of Washington which has to go through all the circuitous routes and hazards of national appropriations. The people of Washington have no vote. Note the following:

On July 22, 1921, the board of education submitted its budget for the school year ending June 30, 1923, amounting to \$10,446,608.24 to the board of commissioners of the District of Columbia. This body reduced the budget by \$2,516,306 and referred it to the so-called government bureau of budgets where a further reduction of \$316,222.24 was made.

The school estimates, therefore, as transmitted by the President to Congress had been reduced to \$7,614,280. The estimates are first handled by the House of Representatives and then by the Senate. The former has its several appropriation committees. One of these considered the school budget in twenty-six consecutive hearings covering 387 pages in a printed document. Another \$756,820 was sliced off the budget and the House passed the same at \$6,857,460. But, the Senate was still to take a whack at the budget. That body suggested thirty-three changes. The House agreed to nine of these increasing the estimates by \$378,300 and disagreed on twenty-two reducing the same by \$378,880. Two other items were compromised. But, the House had its way and the final estimate passed Congress and was signed by the President, June 29, 1922.

Thus, the budget for the year ending June 30, 1923, started on its rocky road of routine on July 22, 1921, and arrived twelve months later, weather worn and disfigured at the school board office. Poor school budget! And all this in the Capital City of the United States!

It would readily be deemed presumptuous on the part of a non-resident to criticize the manner in which a city deals with its school finances, but the national Capital belongs to a whole country. Hence, the right of every American citizen to criticize the tactics employed in providing support for the schools of Washington. And in doing so we cannot blame the people of Washington, but we can reprimand our representatives who lack in an appreciation of an efficient and progressive school system.

When it is remembered that Washington is the seat of government of the greatest Republic on earth, the very shrine of American citizenship, and to find that it deals in a parsimonious and dilatory manner with the most sacred preliminary to government, namely, popular education, we may well demur.

If the national government finds it necessary to engage in routine and red tape in order to protect the treasury, well and good. We do not complain. But, when that government deals with an obvious need with more than ordinary formality and circumlocution, and then misses the great objective by a mile, we have cause to record our disapproval. The deplorable conditions of the capitol's schools are not only a local calamity, but a national disgrace as well.

FUNDAMENTALS IN SCHOOL ARCHITECTURE.

At the recent Chicago convention of the Illinois State School Board Association, Mr. Munson, formerly of Michigan state educational department, discussed the subject of school architecture. He summarized the essentials as follows:

First, select an architect. The cheapest thing that goes into a schoolhouse is the architect's fee. Select the architect because of his ability as such, and not upon the presentation of a pretty colored picture and a fluency of speech.

Second, call for a preliminary plan. An estimate should be made by the superintendent of schools of the number of rooms required, etc., etc. He should provide all the information which the architect may require as to the school needs.

Third, make an estimate of cost. The first test of an architect is his ability in making an estimate that will come within the actual cost. The wide differences between estimate and cost are due to hasty and careless guessing, instead of thoughtful figuring. The architect who is careless here will prove careless in many other things. Great waste has ensued where architects failed to plan in a timely way the cost of items.

Fourth, work out a method of financing. This is the school board's job, namely, to stimulate public sentiment towards giving adequate financial support for a new schoolhouse project.

Fifth, completing the plans. The final plans should be subject to the most careful study. They should be scrutinized more specially as to their completeness from the school house-keeping side, building materials to be employed and the final cost.

What Boards May Demand.

Mr. Munson outlined the elements which the school board should keep uppermost in mind, as follows:

First, Utility. A schoolhouse should be regarded first from the utilitarian point of view. Is this or that feature really practical? Can it be improved upon?

Second, Health. The school board should be specially concerned in all that will make for the physical well being of the child. Give attention to heating, ventilation, lighting, sewage, playgrounds, etc., etc.

Third, Safety. The exigencies of danger should be borne in mind. Stairways should be wide and fireproof. The question of convenient exits in case of a stampede should not be overlooked.

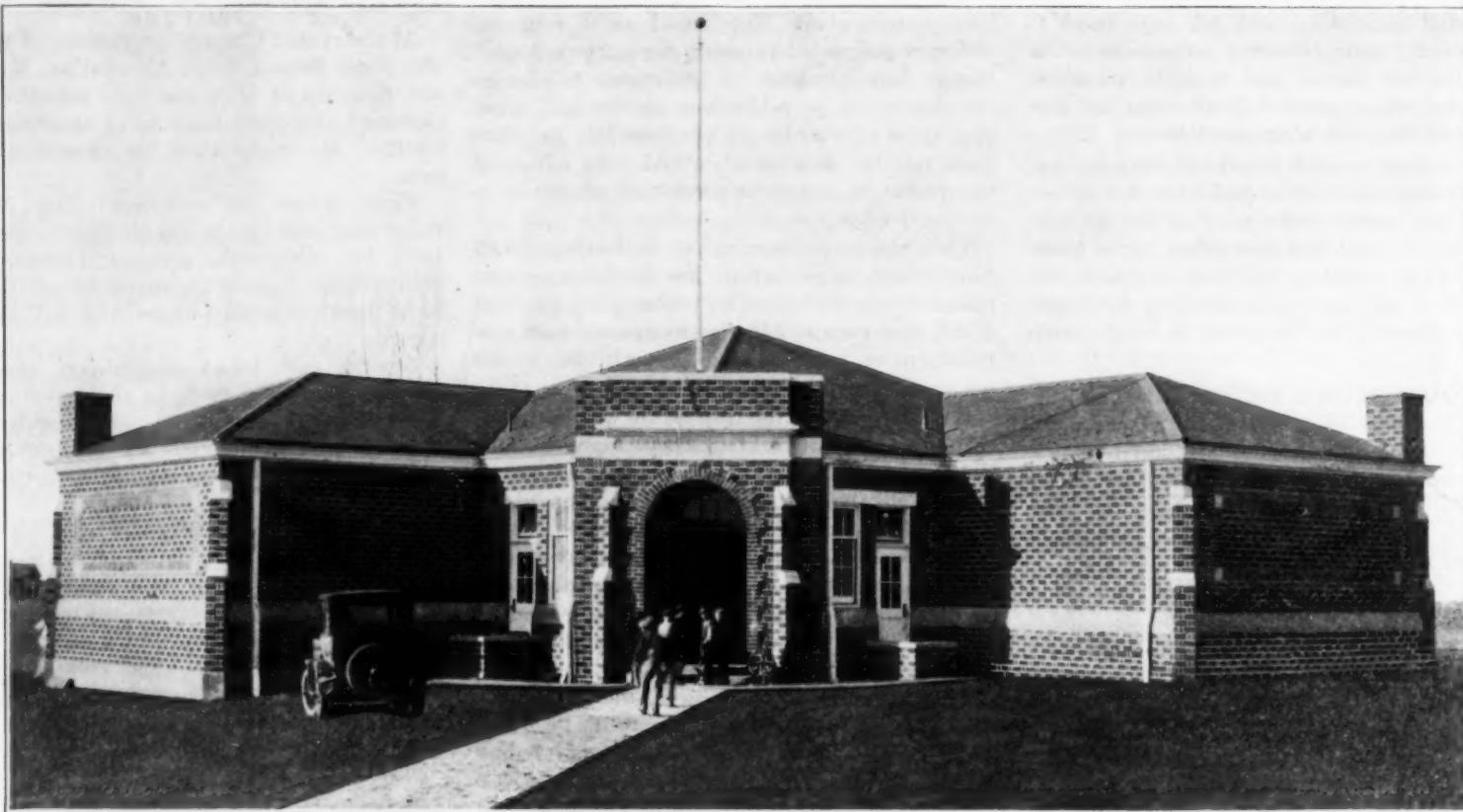
Fourth, Beauty. Simplicity in design is frequently the highest expression of beauty. To ornament a schoolhouse exterior in order to effect beauty is wrong. The design must be beautiful in order to be an ornament. The beauty of a schoolhouse must be achieved from within rather than from without.

Fifth, Economy. The school board should stand ready to appropriate every dollar necessary to provide a good schoolhouse, but at the same time oppose the expenditure of a single penny in a wasteful manner.

The speaker argued against basements, more specially in smaller towns and rural districts. "Where land is cheap why dig into the ground for building space?" he said. Build on top of the ground only. It is cheaper, safer and more sanitary."

CHATS DURING RECESS.

The proverb writer of the Ohio Educational Monthly says: "Ignorance is always noisy, just as the automobile which makes the most noise is worth the least money." That sounds pretty good, but how does that jibe with the tactics of the school tax objector who has both the money and the noise?



SUMMERS SCHOOL, NEAR KLAMATH FALLS, ORE.

THE SUMMERS SCHOOL.

The new Summers school, illustrated on this page, serves a rural community near Klamath Falls, Oregon. It contains three classrooms, a kitchen for the preparation of lunches for pupils and teachers, and toilet facilities.

For reasons of economy, the building contains no basement and the heating is provided by means of jacketed ventilating stoves. Two of the three rooms can be thrown together by means of a sliding door. Each classroom has a built-in, ventilated wardrobe. The kitchen is fitted with an electric range and hot water heater so that warm lunches can be provided during the winter months. Water for drinking and for sanitary purposes is taken into the building direct from a deep well, by means of an electrically driven automatic pump. Sewage is disposed of by means of a septic tank. The exit doors are fitted with panic bolts.

The walls throughout the building are of brick, laid in the ideal Rolok way. The trimmings are of cast cement.

THE ROOSEVELT JUNIOR HIGH SCHOOL.

(Concluded from Page 73)

The electrical work is complete. The building is equipped with a Clock System, Program Machine, fire alarm inter-connected telephone system, etc.

The building contains a total of 1,500,000 cubic feet and was erected in 1921-22 at a contract price of \$430,000 on the basis of cubic contents. The building cost a little less than 29 cents a cubic foot.

DUSTLESS PLAYGROUNDS.

The playgrounds surrounding the schools of Detroit, Mich., are said to be dustless. The board of education of that city now explains how this is accomplished, in the following:

All grass, weeds or humus material shall be removed from playground area and if fill is necessary only good soil or cinders free from dirt or ashes shall be used.

The finished grade shall be as shown on plan, and any excavation or fill necessary to obtain this grade shall be done as directed. All sur-

plus earth shall be removed when and as directed.

First Course: Cinders not to exceed 2" in diameter and free from dirt or ashes shall be spread to a depth of 3", wet and rolled with a suitable roller until no wave forms in front of roller. The finished grade of this course shall parallel the finished grade of the finished surface. This course shall be wet before the second course is applied.

Second Course: This course shall consist of 2½" of limestone screenings and dust spread evenly over the first course. This course shall be rolled with a suitable roller and sprinkled between rollings until a smooth, compact surface is obtained.

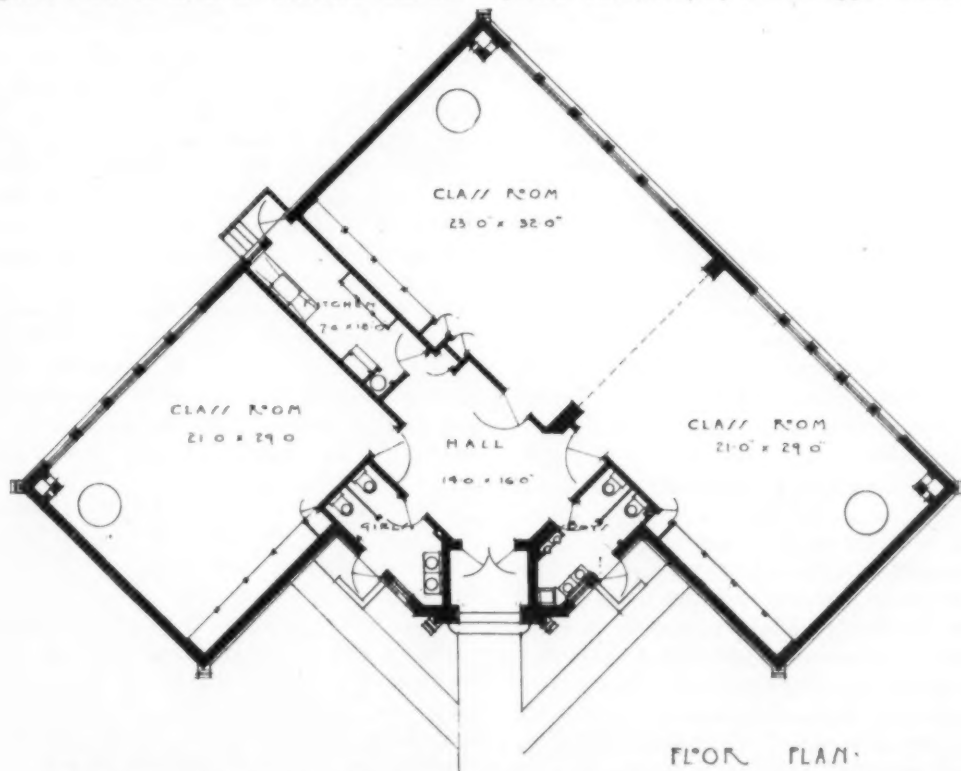
Third Course: This course shall consist of approximately ¼" of coarse, sharp sand, free from dirt and dust.

Fourth Course: Calcium Chloride (Wing & Evans or its equal) shall be spread evenly on surface, 1½ pounds per square yard, according to manufacturer's specifications. Care shall be taken that it does not touch any lawn or shrub area.

Supervision: Material and workmanship shall pass the inspection of the Landscape Architect for the Board of Education or some person authorized by him to approve the same.



ENTRANCE DETAIL, SUMMERS SCHOOL, NEAR KLAMATH FALLS, ORE.



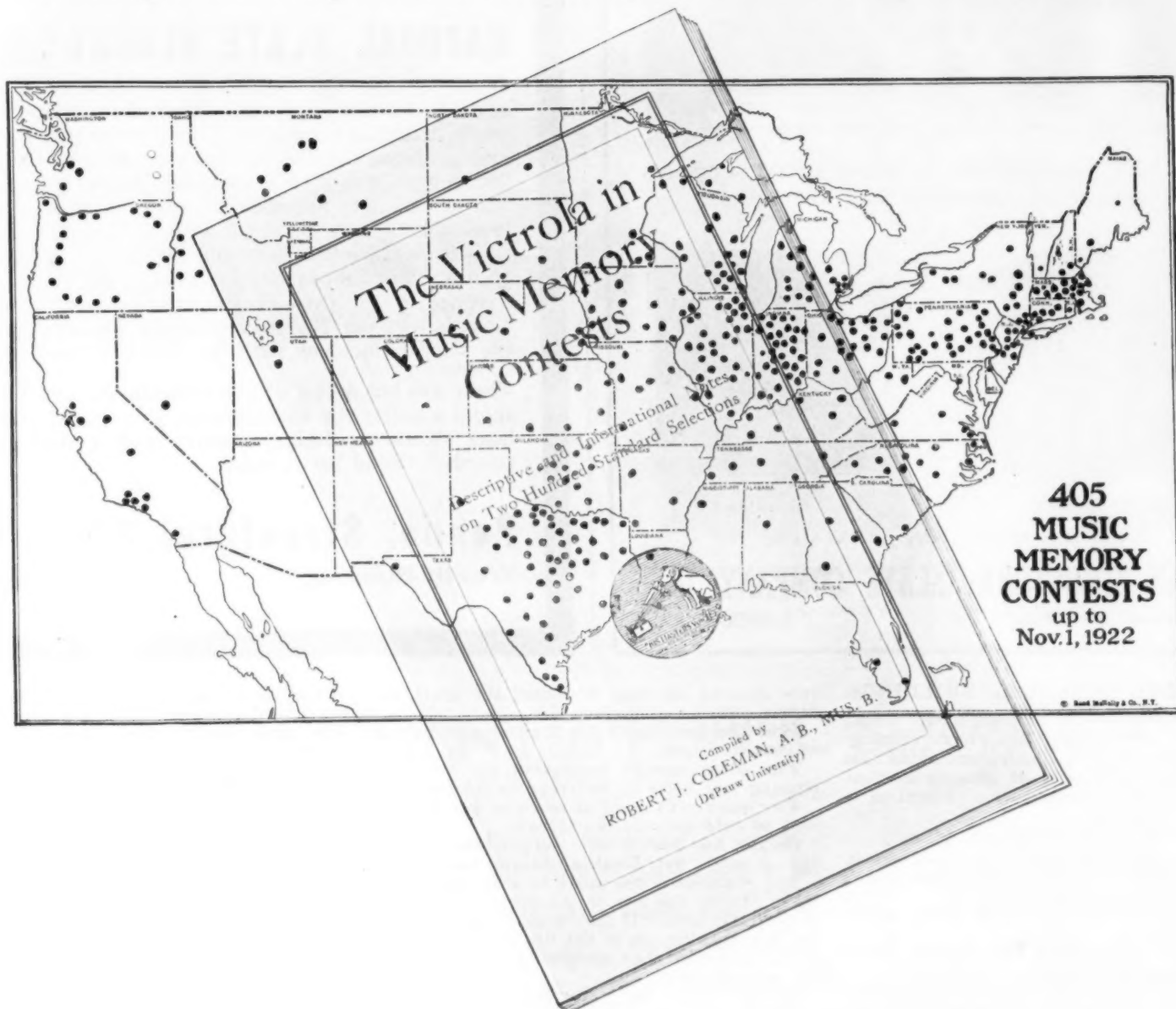
FLOOR PLAN OF SUMMERS SCHOOL, KLAMATH FALLS, ORE. G. R. Wright, Architect.

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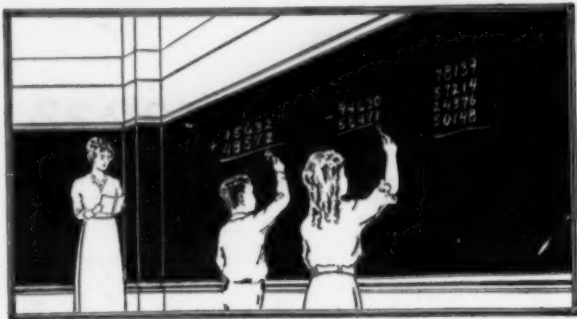
Educational Department

Victor Talking Machine Company, Camden, New Jersey

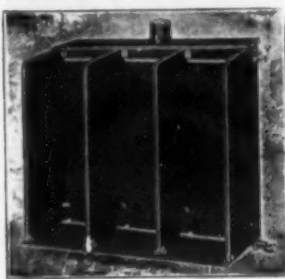
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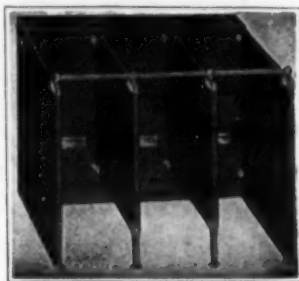
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These are but a few of the advantages. Before you spend a dollar for Blackboards, you should read our book "How to Judge, Specify and Install Blackboards." Send for it today.

Penna. Structural Slate Co.

Worth Building

Easton, Penna.

SAVING COAL IN SCHOOL BUILDINGS.

Messrs. Parkinson & Dockendorff, school architects at La Crosse, Wis., have recently issued a bulletin to their clients, concerning fuel economy. The bulletin is of general interest and value to all school authorities. Attention is called to the following:

About the Building.

The steam used for heating the building is generated from fuel at considerable cost. Save the steam and you save the fuel.

Do not start the plant too early in the morning.

Do not heat the building after school hours or for unnecessary purposes.

Do not overheat the school. If 68 degrees is sufficient, maintain that temperature in all rooms. There is a relation between temperature and humidity. Maintain the proper relative degree of each and your rooms will be at the comfort zone. This will not only save coal but will conserve health of pupils and increase their efficiency.

Shut off radiators when not required, or to reduce the temperature.

Keep corridors cool. Pupils are moving in corridors, or should be, and rooms will feel warmer when passing in from a cool corridor.

Shut off ventilators or other outside openings in buildings at night, or when school is not in session.

About the Boiler.

Your boiler is provided with a furnace and combustion chamber in which the fuel is burned and also with the proper amount of heat absorbing surfaces where heat is transferred to the water and steam.

The fact of a "strong draft" that would "draw a newspaper up the chimney" is not evidence of the right kind of draft to generate steam and properly consume the coal. It requires about 300 cu. ft. of air for the proper combustion of one pound of ordinary coal. This air must pass through the firebox slow enough to permit mixing with the furnace gases for proper combustion.

Keep the grates well covered. The depth of the fire will be governed by the amount of draft and the kind of coal, i. e., the coarser or more

free burning the coal or better the draft, the deeper you can carry your fire.

Find the best depth for the fire and keep it at that thickness.

Fire often enough to prevent the fire from burning into holes or in irregular thickness.

Fire quickly to avoid as much as possible the rush of cold air into the furnace.

Do not fire coal in sizes larger than a hen's egg or man's fist, break up larger lumps.

The grate bars are made to rock and dump. When at rest the top of the grate bars should be perfectly level. If the "fingers" of the grate are left sticking up in the fire they may burn off or the grates may warp as a result of heating one side only.

Do not shake the grate any more than is necessary to keep the ash from fusing into clinkers and to let sufficient air through to make the required amount of steam. Too much shaking may waste good coal into the ashpit.

Do not let ashes accumulate in the ash pit. If the fresh air supply under the grates is not sufficient, with a live fire on top of the grate, the grates are liable to warp or melt.

All tubes and smoke passages should be kept clean—a small amount of coating of scale or dirt in the tubes means a large percentage of loss of heat. The cleaner you keep the fire surfaces the more heat they can absorb, hence a saving of coal.

The soot doors should be opened frequently for removing any soot or residue from the coal that might lodge on the boiler shell.

Any accumulation of soot under the boiler should be removed through the large cleanout door which opens into the rear combustion chamber.

The boiler is fitted with three handhole plates in the front head. The plates of the two lower handholes should be occasionally removed for cleaning out any dirt or sediment that may settle or accumulate on the crown sheet directly over the fire.

Do not remove the manhole plate on top of the boiler unless it becomes necessary to make internal repairs to the boiler. If in removing the handhole or manhole plates the gasket is found defective, new gaskets can be easily put in place by anyone in charge of the boiler.

Fusible (or safety) plug: This is located in the crown sheet of the boiler directly over the fire. It is made of brass with a core of softer metal which melts at a comparatively low temperature when not covered with water. Should the water, through neglect or otherwise, get below the crown sheet, this fusible plug is supposed to melt and the steam and water blowing into the firebox will tend to check the fire and give warning to the person in charge. In case of such fusing put out the fire. Remove the old brass plug (with an ordinary monkey wrench) and screw in a fusible plug.

When you have the large handhole open to clean the crown sheet, scrape the top of the fusible plug to remove any dirt or incrustation that may have settled on it.

The water gauge has a small pet cock at the bottom of the glass. Open this occasionally and let the steam and water blow through to make sure there is no stoppage in the water glass connections.

Always leave both valves on the water gauge open, unless necessary to close them temporarily to renew a gauge glass.

Finally.

Keep the water line at the proper height in the glass.

Keep the ashpit free from ashes and top of grates level.

Wash out the boiler spring and fall.

If two pounds of steam is sufficient to do your heating, do not carry three or five pounds.

Keep the smoke passages free from dirt or soot. The Century grate bats are interchangeable and any single part can be easily replaced.

Try safety valve frequently.

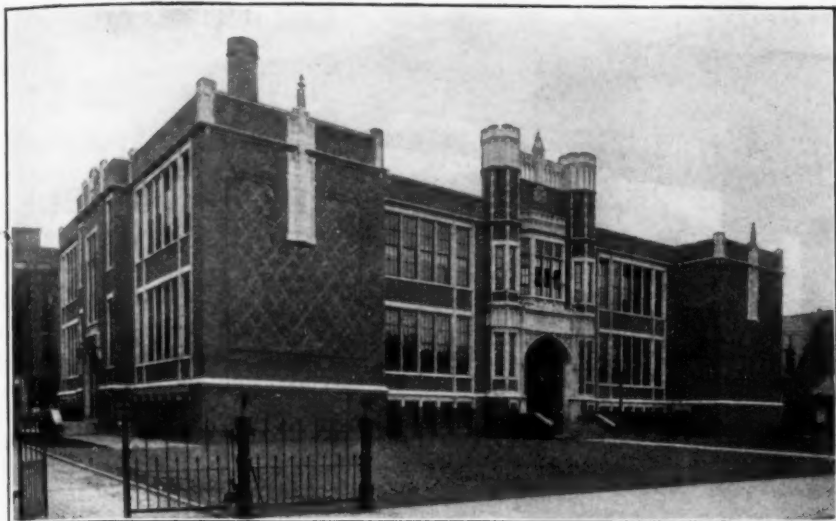
Fire evenly and regularly.

Soot.

Soot lowers the heat absorbing efficiency of boiler heating surfaces. Soot obstructs the passage of the products of combustion. Soot is a direct cause of corrosion. And soot is smoke. Altogether soot is the undesirable element of the boiler plant, an enemy of efficiency that is always present and cannot be entirely eliminated, but must be limited if economy in steam generation is to be realized.

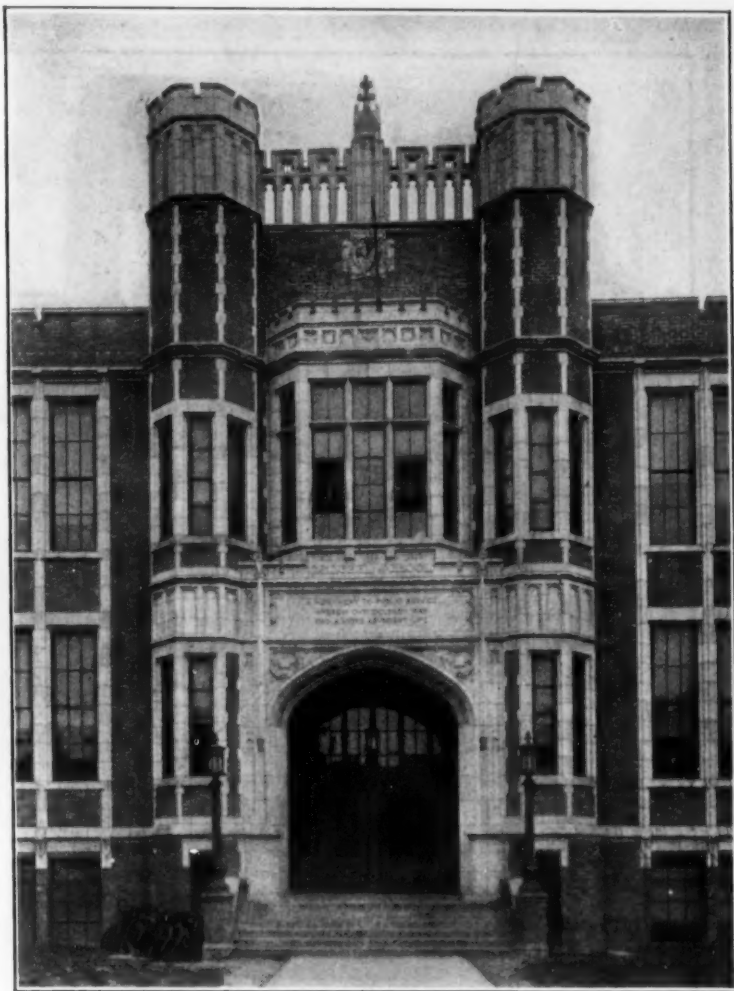
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CENTRAL HIGH SCHOOL
UNIONTOWN, PA.



Buff matt glazed Terra Cotta

A. F. COOPER, Architect



Terra Cotta's marvelous adaptability to form is revealed by the detail of this entrance. No matter how simple or how delicate or involved a design may be, Terra Cotta can be counted upon to carry out the designer's ideas perfectly.

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SO reads the inscription over the main portal of Central High School, Uniontown, Pa. And this school, designed according to the best tenets of school architecture, is a worthy monument from the point of view of external beauty as well as of scholastic usefulness.

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The "Empire" Movable and Adjustable Chair Desk is made in six sizes to fit the various grades and has five adjustments so that each pupil may be individually fitted. For all classroom purposes it is the most practical, durable and economical.



Tablet Arm
Chair No. 26

Is built like the Empire Movable and Adjustable Chair Desk, being reinforced by eight concealed steel tie rods running directly through the chair. This means great strength and service.

The Tablet Arm is so constructed to allow pupils to write to bottom of tablet without the chair back interfering.

Portable Chair No. 535

Features of worth on Portable Chair No. 535 are the malleable hinges which hold the weight instead of the legs and binders and the screw and belt fastening of the hinges. This means absolute permanency, no matter how many times the seat is banged or jarred. Constructed of either maple or oak as desired, and finished in dark brown or dark golden oak.

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We will appreciate an opportunity to figure on your requirements and can give you quality furniture at the lowest price consistent with good workmanship and the best of materials.

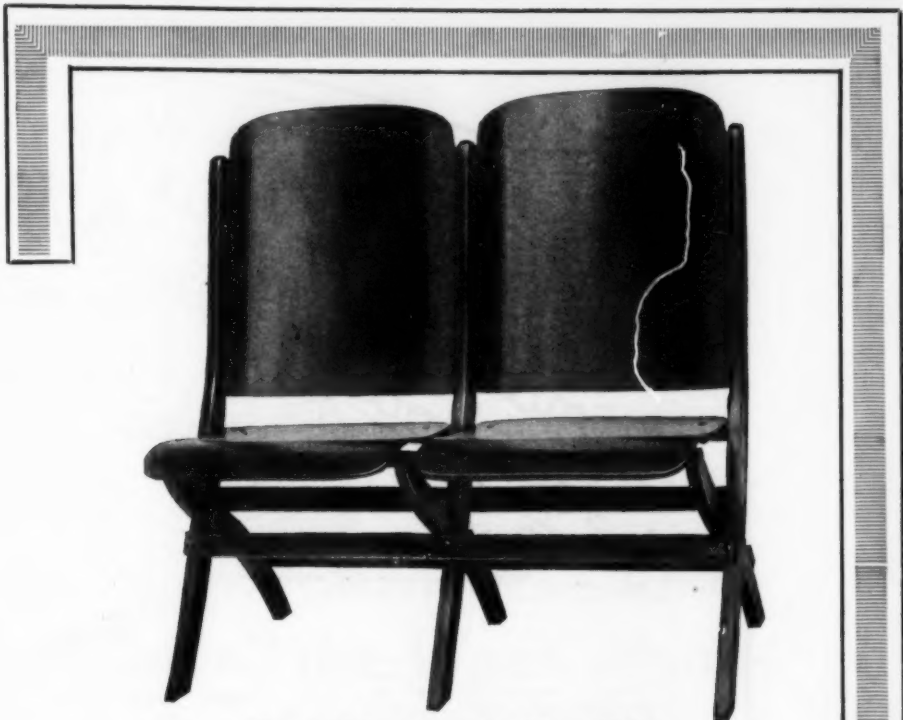
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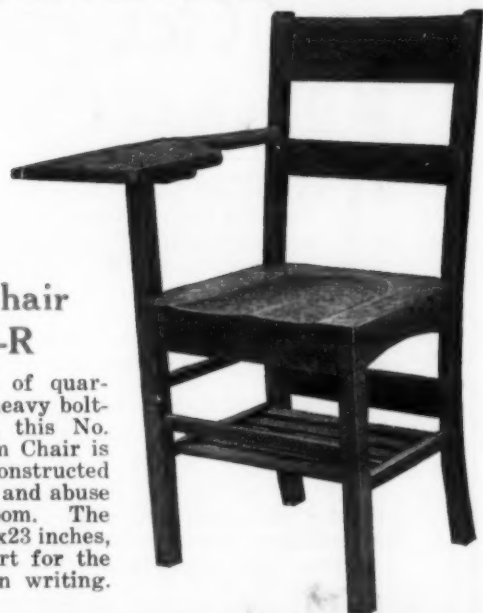
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In your Auditorium the No. 500 Portable Chair will give years of service and satisfaction.



Tablet Chair No. 17-R

Manufactured of quartered oak with heavy bolted construction, this No. 17-R Tablet Arm Chair is designed and constructed to stand the use and abuse of the schoolroom. The Tablet arm is 10x23 inches, providing support for the entire arm when writing.



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This Portable Chair No. 525 is built for comfort and service. A reinforcing thin strip across the back adds strength. For a good, substantial medium priced portable chair, specify No. 525.

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All we ask is that "No-Waste" Tissue be used so long as we continue to supply it at fair competitive prices.

"No-Waste" is the most satisfactory paper you can buy at any price, because it is (1) soft as velvet; (2) extra strong by reason of extra-long, absorbent fibres; (3) economical, the net saving with "No-Waste" fixtures being 20% - 30% as compared with roll paper; (4) sanitary—guaranteed all clean, fresh spruce-wood with no pulp made from old waste papers.

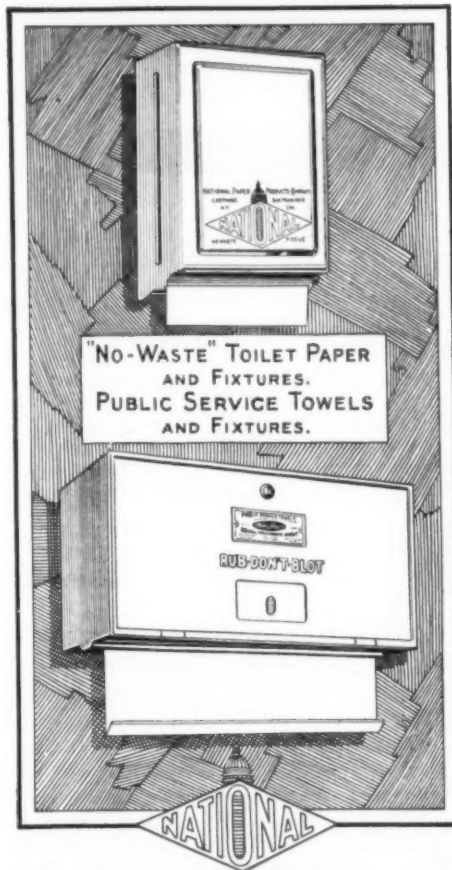
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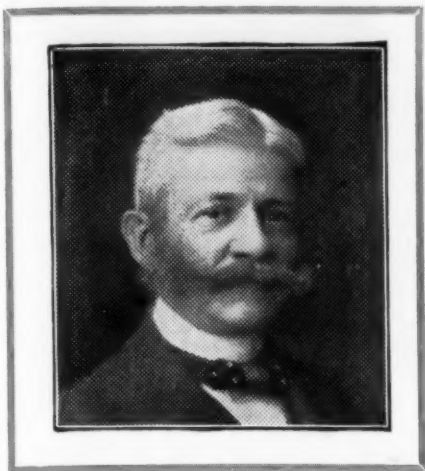
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(Concluded from Page 80)

As a destroyer of boiler efficiency, soot is more potent than would be five times the thickness of asbestos spread over the heating surfaces. In obstructing the passage of gases it not only reduces the area of free passage, but the soot clinging to the heating surface has a marked retarding effect on the flow of the gases in proximity to the heating surfaces, thus further reducing the rate of heat transfer to boiler contents. Corrosion of boiler tubes and surfaces is accelerated by deposits of soot, either through electrolytic action or the eating away of the metal by the sulphur constituents that are present, to some extent, in all soot. Then soot contains, or is, practically all the visible, wasteful and objectionable constituents of smoke. Within the furnace, boiler and flues soot is merely soot; issuing from the chimney it is black smoke.

Suppose that, as some claim, one thirty-second inch of soot on the heating surfaces produces as great a loss as blowing out a pound of steam for every ten pounds generated. Steam escaping into a boiler room at any such rate would soon make it impossible for the fireman to remain near his boiler and would be such an evident sign of waste that it would not be countenanced in any plant, no matter how slipshod its operation. Nevertheless, a mean thickness of one-thirty-second inch of soot may be found on the heating surfaces of many a boiler—it will frequently collect in ten hours' operation. Again, assume that a three-sixteenth inch coating would be as detrimental to efficient operation as throwing away seven pounds of steam for every ten pounds generated which, if allowed to escape into the boiler room, would quickly scald to death the boiler room force or bring about their asphyxiation. Three-sixteenths inch of soot is rarely found clinging to all heating surfaces, it is true, but such accumulation is not unknown in out of the way corners of the boiler, corners that are difficult to cleanse of soot.

Perfect combustion of fuel would be the only way of eliminating soot. This being impossible of realization, every means of improving combustion must be taken. Too great efforts to prevent soot accumulation cannot be made, for

it surely and continually settles on every surface that lies in the path of the products of combustion.



—Morgantown, W. Va. The school board has purchased a twelve-acre plot of ground near the center of the city which is to be used as a stadium, tennis court and playground center. A new high school will be erected in the near future. Plans have also been made for an addition for the second ward school building. Additional grounds have been purchased at the first ward, Woodburn and Westover buildings.

—Berea, O. The local Kiwanis Club is supporting a survey which is being made of the need for a new high school building in the near future.

—Upper Darby, Pa. In September of this year, a twelve-room grade school was opened at Drexel Hill. Eleven of the rooms were occupied at the opening of the building. Another twelve-room building will be erected at Stonehurst, to be occupied in September, 1923. Ground will be purchased for a new building to replace the one at Fernwood, the building to be occupied in 1923.

—Aberdeen, Wash. Overcrowded conditions in the schools call for an increased number of buildings to house the constantly increasing school enrollment. The board of education has asked the citizens to vote on a bond issue of \$100,000 for the first unit of a junior high school to take care of the eighth and ninth grades. In addition, the board has asked a levy of two mills to raise \$16,000 for the erection of the new Whitman School.

—Philadelphia, Pa. Without increasing the taxes for 1923, the finance committee of the

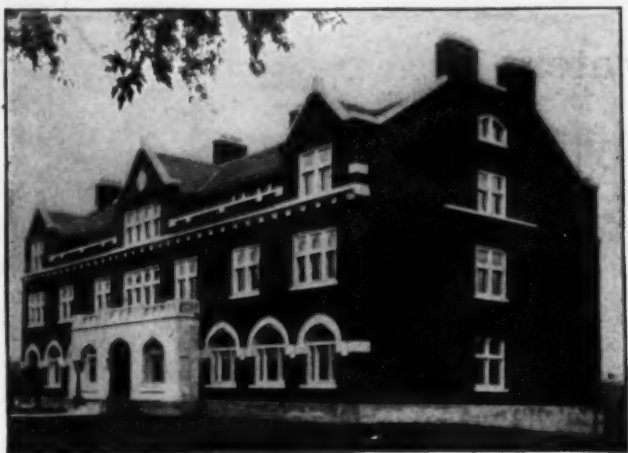
board has approved an expenditure of \$15,000,000 for the improvement and modernizing of school facilities, as well as an increase in school expenses. The \$15,000,000 building program of the board is to be started, and such parts of it as it will be possible to complete will be financed under the rate of 95 cents on every \$100. It is estimated that there will be \$500,000 which can be appropriated out of current revenue for lands and buildings and which will admit of the construction of two or more of the new schools without a loan.

—In a set of recommendations to the Fayette County Board of Education of Kentucky, State Supt. George Colvin declares that while temporary measures should be taken to relieve the embarrassment caused by the consolidated school system and the lack of transportation, the board should adopt a plan of county-wide consolidation with local district taxes to supplement the county fund.

Fayette has several expensive model schools and a number of the poorer one-room schools scattered over the county. It has a county high school near Lexington, which ought to be abandoned as a high school, using the rooms for grade purposes and sending the students to the city.

—Adams, Mass. Mr. Charles T. Plunkett, chairman of the local school board, has offered to make up out of his own pocket, the difference between a \$250,000 appropriation for a junior high school building and the actual cost of the structure which is now \$425,000. Mr. Plunkett some time ago gave the city a \$30,000 lot for the new school.

—Appalling school expenditures, the need of regional high school districts and the demand for new methods of taxation were featured in a recent address of State School Commissioner John Enright of New Jersey. Mr. Enright pointed out that a new method of taxation for schools must be found if the schools are to go on increasing in numbers and cost. He pointed out that Delaware has partly solved the school expense problem by collecting an income tax from everyone in the state. Mr. Enright called attention to the fact that educators everywhere are being swept off their feet by the urgent demands for better education and by the no less



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urgent demands of taxpayers for a reduction of the mounting cost. Some of the outlying districts, Mr. Enright declared, are not large enough to support high schools, yet these children are entitled to the same rights as other children. In many rural districts, high schools are missing and thousands of dollars are paid for transportation to places that will take in these pupils. This cost half a million dollars last year. High schools of the state are overcrowded and thousands who seek admittance are kept out because of a lack of seating space. Regional schools, said Mr. Enright, would perfect the educational system of New Jersey as nothing else would. A high school in keeping with the regional idea can be built today for \$500 per capita.

—Indianapolis, Ind. An estimated amount of \$1,470,000 will be necessary for carrying out the building program recently prepared by the board of education. The program calls for eight new buildings and additions, a new shop unit for workmen, and a heating plant. It was ordered that auditoriums and gymnasiums be provided where necessary, despite the increased expense involved in their inclusion.

—Selma, Ala. The school board has asked the city council for an increase in funds for general school purposes.

—Utica, N. Y. The board has renamed two of the grade schools, designating them the George Washington and the Abraham Lincoln Schools.

—Louisville, Ky. Approximately \$1,800,000 have been asked of the city by the board of education for school purposes during the coming year. The increase provides for equipment for new schools being built, construction of portable schools, repairs and additional disbursements on account of annexations. The total of estimated expenses for the year is \$2,444,373.

—County school taxes must bear the cost of their collection, and sheriffs or collecting officers are entitled to but one per cent of the total school tax of their respective counties as commissions, according to a ruling of the Kentucky Court of Appeals in the case of W. E. Ross, sheriff, against the county board of education of Jefferson County and the county against Ross. Under the ruling former sheriff Ross must re-

fund to the county board \$5,926, excess commissions received by him for collecting the 1921 school tax. He was allowed by the court to retain \$5,206 in commissions for collecting the 1920 tax on the ground that he was then acting as an agent for the state.

The county board of education contended that only one per cent of the amount collected should have been retained by Ross, and suit was brought against him to recover excess commissions. The lower court held that the school board was entitled to the net sum which the tax produced and that the sheriff had no right to retain any portion of the tax for commissions, and that the county of Jefferson was obliged to pay Ross for the commissions in collecting the school tax.

In reversing the judgment against Ross, the Appellate Court held that Ross had turned over the 1920 collections to the state auditor before the action for refund was started, and that the money was collected by him for the school board in good faith and that his commissions were paid to him by the proper authorities. The excess commissions for 1921 being still in his hands when the suit was brought, the court held that the judgment against him in this particular was properly rendered.

—Meeker, Colo. Bonds in the amount of \$75,000 have been voted for the erection of a high school for Rio Blanco County.

—San Diego, Calif. The new Memorial junior high school was dedicated on November 12th in the presence of a large gathering of friends and patrons of the school. The new auditorium which was used for the first time at the dedication exercises, was taxed to its fullest capacity to accommodate 1,200 guests.

—Lancaster, Pa. The board of education during the past summer spent \$75,000 in repairs and improvements to the school plant. A building program will be started in the spring. Provision for these buildings was made by the passage of a bond issue of \$1,250,000 last June.

—The commission which recently made a survey of the Indiana schools, in its report, recommends that a division of schoolhouse planning be established as a part of the State Education Department in order to safeguard the expenditure of funds for permanent school improve-

ments. The division of schoolhouse planning would cost \$10,000 a year to operate, according to estimates of the commission. In summarizing its investigation of buildings, grounds and equipment of the state, the commission says:

"To guard against waste of public money through the building of schoolhouses where they are not needed, and against excessive expenditure on schoolhouses, and to guarantee that all new structures meet reasonable schoolhouse requirements, educational as well as sanitary and hygienic, the present work of the State Board of Health, which looks after the sanitary and hygienic features of school buildings, and the work of the state board of accounts, which scrutinized the business aspects, should be supplemented by a division of schoolhouse planning in the state department of education."

—The school board of Indianapolis, Ind., has ordered that the amount of \$23,000 be paid to the firm of Snider and Rotz for architectural services rendered to the board under a contract entered into in August last.

The payment of the bill was opposed by President C. L. Barry of the board who held out for a settlement after the final adjudication of the suit brought against the architectural firm by the state. About \$100,000 is involved in the litigation, which grew out of contracts entered into between the board and the firm previous to August, 1921.

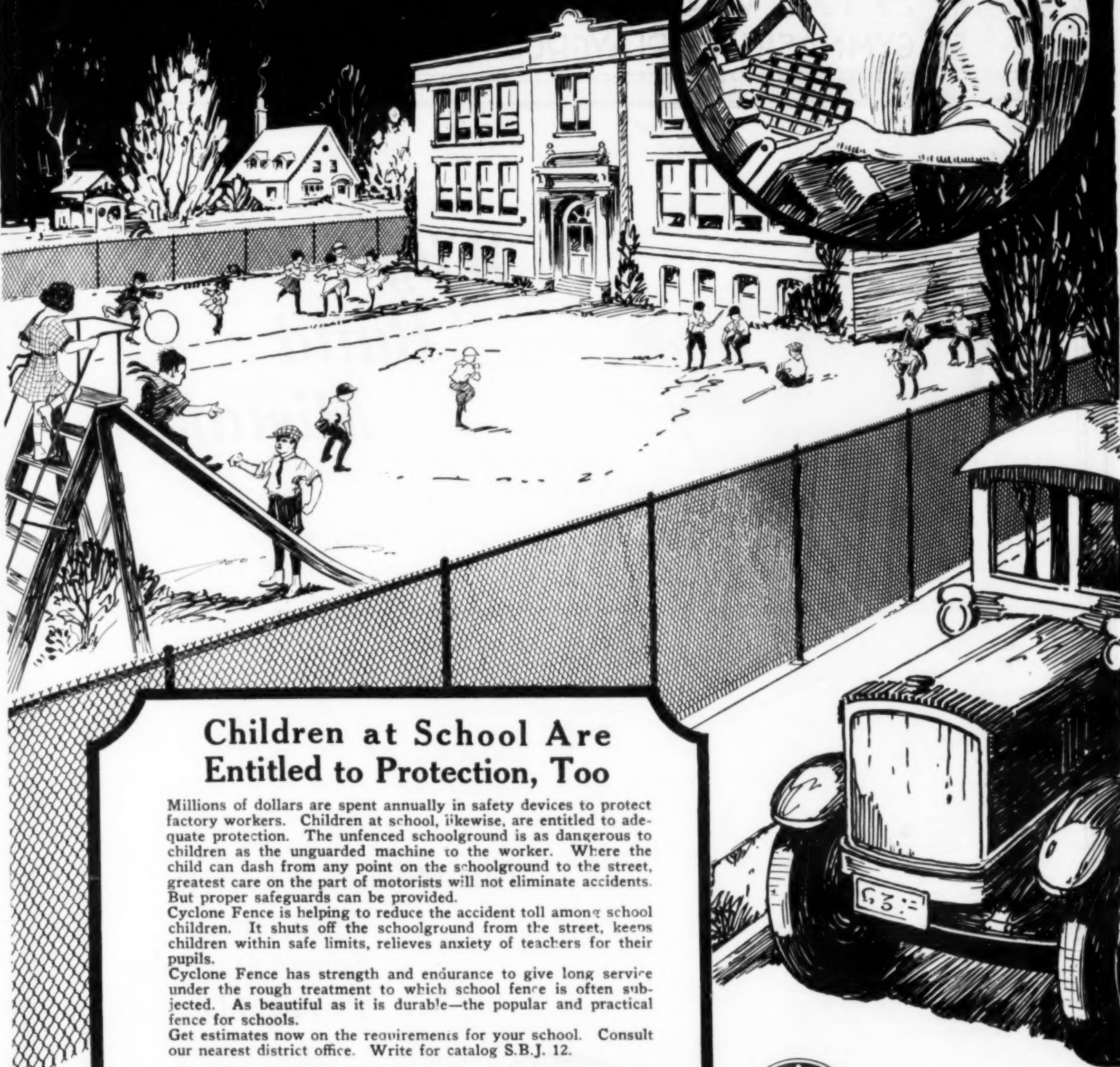
—Marshall, Mo. The voters have approved a bond issue of \$200,000 for completing the new high school. The completed structure will cost about \$300,000.

—It cost an average of \$50 to send each child in Indiana to the elementary school last year, according to reports from the State Education Department. The per capita cost for high school students averaged approximately \$116. The cost for the year was determined from the reports received from the several counties.

—Fiscal courts have no alternative but to levy the capitation tax ordered by county boards of education, the Kentucky Court of Appeals has held in a decision affirming the ruling of the Jefferson Circuit Court in the case of the Fiscal Court of Jefferson County against the County Board of Education. The court held that the

(Continued on Page 89)

The Law Provides Safety for Workmen -



Children at School Are Entitled to Protection, Too

Millions of dollars are spent annually in safety devices to protect factory workers. Children at school, likewise, are entitled to adequate protection. The unfenced schoolground is as dangerous to children as the unguarded machine to the worker. Where the child can dash from any point on the schoolground to the street, greatest care on the part of motorists will not eliminate accidents. But proper safeguards can be provided.

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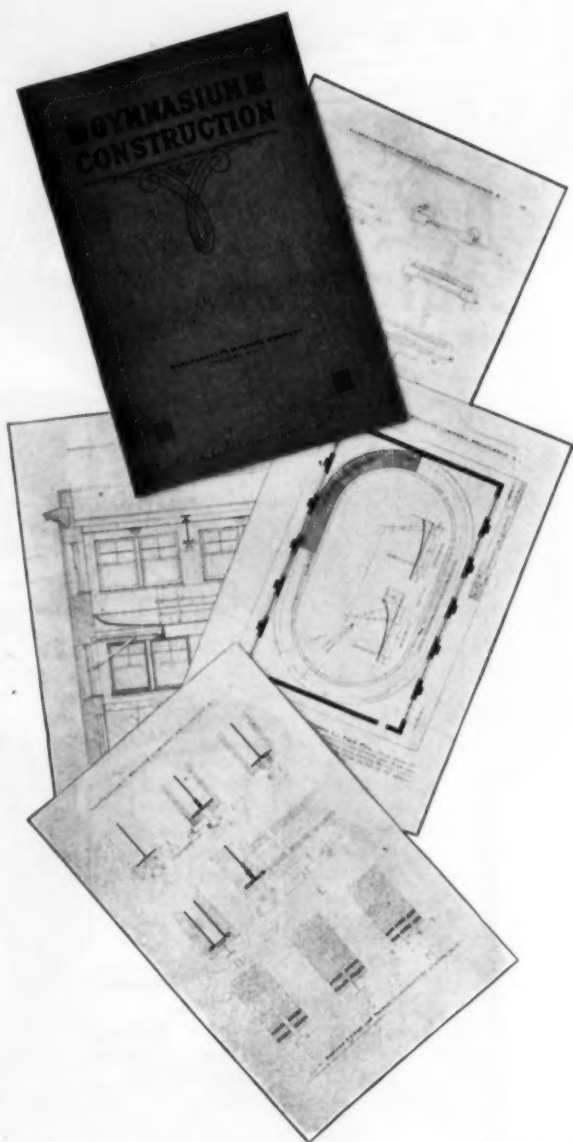
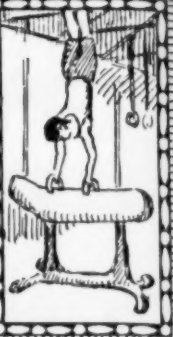
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*The best Equipment
Can't correct
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This Manual is Free to
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School Officials
Physical Directors

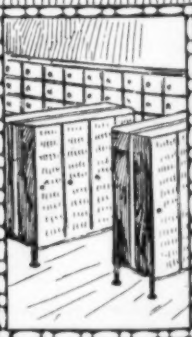
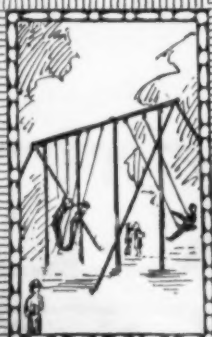


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Realizing that Thrift means more than just saving money, have you become somewhat discouraged from considering a thrift course because the ideas presented to you have apparently all hinged upon the one idea of "getting the money"?

Don't you believe the banking of money, by children, should be the result of lessons learned and not the duty of the teacher, any more than actually mixing nitric and hydrochloric acids is the duty of the teacher, in every pupil's case, to prove the result is Aqua Regia and will dissolve gold? Should not the value of saving be the lesson taught but the actual saving be done by the child, itself, as proof that the lesson has been learned?

Just as Chemistry needs a laboratory, Arithmetic a blackboard and Geography a map, so does Thrift need the opportunity to bank. Automatic Receiving Tellers are giving this opportunity to hundreds of thousands of pupils every day and the banking is done by the pupils, themselves, the same as laboratory work.

They make the opportunity a daily one like daddy enjoys.

They relieve teachers of all work and responsibility, class routine of all interruption, principals of every annoyance, and you of any complaints of extra burdens.

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Without any obligation implied, the mailing of the coupon will afford us the pleasure of sending you full details concerning Automatic Receiving Tellers.



AMERICAN BANKING MACHINE CORPORATION 404 WRIGLEY BUILDING, CHICAGO

NUMBER OF SCHOOL BUILDINGS..... NAME
ADDRESS ENROLLMENT

(Continued from Page 86)

board of education is the sole judge of the needs of the schools and that the fiscal court has no alternative but to levy the tax provided it is within the statutory limits. Where there is evidence of fraud in the makeup of the budget, it was pointed out, the fiscal court may deny the levy.

—An increase of several hundred thousand dollars has been asked by the board of education of Louisville, Ky., in connection with the submission of its budget to the mayor. Overcrowded schools, enormous increases in enrollment, and problems of annexation have been given as reasons for the increase.

—State Supt. George Colvin of Kentucky has asked the county attorney of Ballard County to take steps toward the recovery of several thousand dollars alleged to have been illegally spent by the county board of education in 1920, 1921 and 1922. It was pointed out that the county board has no authority to incur obligations in excess of the anticipated revenue for any year and that persons responsible for illegal expenditures must be prosecuted.

—Minneapolis, Minn. The school board has taken steps toward the selection of school districts which are to be favored with new buildings in accordance with the general plans for a \$10,000,000 building program. The board has adopted a five-year program to include the erection of fifteen grade schools, seven junior high schools and one vocational school, with administrative offices and a supply house. The improvements include additions to buildings, erection of field houses for athletic fields, and landscaping. About \$1,000,000 will be spent for school playgrounds.

—Kansas City, Mo. The voters have recently approved a five-million-dollar bond issue. The bond issue which is the second to be voted in a year and a half will be devoted to further school building projects. About half of the issue previously voted has been expended for new buildings.

—Cincinnati, O. The school tax levy, as well as the city levy, was defeated at the election held on November 7th. The school board intimated that it would take legal action to have

the extra levy put into effect since it required only a majority of votes as an educational measure. The vote was 836 short of being sixty per cent of the entire voting power.

—Huntingdon, Pa. The voters of Mt. Union have approved a bond issue of \$145,000 for financing the erection and equipment of a high school in the third ward.

—Westfield, Mass. A survey of the present and future needs for a school building program will be made shortly by a special committee of the school board. The board members are agreed that there is need for a definite building program and for accommodations for housing the increasing school population.

—Los Angeles, Calif. The board of education has taken steps toward the expenditure of the \$17,500,000 bond issue. The board has adopted sketches for a new elementary school at Hermon, and for additions to the McKinley Junior High School.

—Wausau, Wis. The board has included a special tax of two mills in the tax roll for a special school building fund. A survey of the school plant is also to be undertaken to obtain facts and figures upon which to base a solution of the school problem. The board plans additions to the Central School and to the high school to cost about \$150,000.

—The board of education at Bellevue, O., has taken steps to enlarge the high school plant. It is planned to build a new auditorium and gymnasium, combined with a number of classrooms. The auditorium and gymnasium will be used for school and community purposes.

—Sacramento, Calif., is erecting a new high school, at a cost of \$1,540,000. The building which is about half completed, will occupy a site of thirty acres and will take care of two thousand students. Provision has been made in the building for an agricultural department, all types of shops for vocational training, and for gymnasiums for boys and girls.

In addition, eleven new elementary schools are being erected at a cost of \$3,000,000. The buildings are built on the unit plan and are standardized as to floor plans. All classrooms are fitted with movable furniture and the floors are covered with battleship linoleum.

The present building program will cost more than \$5,000,000 and millions more will be needed to complete the work outlined.

—Ashtabula, O. On November 7th the citizens of the school district voted to give the schools a three-mill additional levy for five years. This action indicates the citizens have faith in their schools and will support them.

—Cincinnati, O. By a little more than 800 votes, the extra school tax levy was defeated at the recent election although there was a majority of almost 25,000 votes in its favor. The school board plans legal action to have the extra levy put into effect on the ground that as an educational measure it required only a majority of votes. The measure was lost because of the requirement of sixty per cent of the electors' votes.

—The Hughes High School, at Cincinnati, O., recently dedicated two beautiful lunettes as a memorial to former Hughes men who served in the world war. Principal C. M. Merry presided at the exercises while Mr. C. J. Barnhorn, sculptor of the lunettes, explained the symbolism of the work. High tribute to the character of the Hughes men, many of whom were members of the 136th regiment, was paid by Col. Lincoln P. Mitchell.

—Sharon, Pa. Ground has been broken for the erection of a new junior-senior high school. The building will accommodate 1,600 students and will cost about \$600,000. Messrs. Taylor & Hanna, of Sharon, are the architects.

—Wellington, Kans. The board of education has erected five one-room units on the grounds of the large central building to house a junior high school having an enrollment of 450 students.

—Lebanon, Pa. A movement has been begun in the community for a new high school building to take care of the increased enrollment, which at present nearly doubles that of ten years ago. The high school is at present housed in an old normal building made famous by the early founders of the normal school idea in the community.

—In the belief of a committee of the Springfield, Mass., school board, headed by Dr. George H. Foss, it will require \$3,000,000 for new schoolhouses during the ensuing six years.

B

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Book trucks
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School library supplies

Administrative school records and files for superintendents, principals, department heads, secretaries, etc.

Write for catalogs and information

—In Boston, Mass., ten new schoolhouses are in course of construction involving an expenditure of \$2,000,000. The board now believes that it is seven months ahead of its building program.

—In 1921 the money at the disposal of the Louisville, Ky., school system was \$1,278,951 and in 1922 it was \$2,384,375. This made an average cost of \$5.72 per citizen in 1921 and \$8.15 for 1922. A bond issue of \$1,000,000 for eight new school buildings was voted during the year.

—Key West, Fla. A new senior high school will be erected at a cost of \$50,000. During the coming year it is planned to spend \$12,500 on the improvement of colored schools and the erection of a junior high school to cost \$50,000.

—A constitutional amendment has been passed in the Florida legislature allowing the raising of the school tax from three mills to ten mills. The passage of the amendment promises to raise Florida quickly from the educational position of 46th state.

—Corry, Pa. At a recent election, the citizens voted a bond issue of \$175,000 for the erection of two schools, a primary building and a junior-senior high school. The passage of the bond issue came after an intensive preliminary program of educational publicity covering a month's time. The result shows the faith of the people in the schools and a belief in the better type of school facilities.

—Montgomery, Ala. The school board has recently acquired two building sites of seven acres each for two elementary schools. This marks the beginning of a building program and the expenditure of a million dollars in bonds for new schools, sites and equipment. The bond issue which was approved by the voters the past summer, includes provision for a \$500,000 high school.

—The school board of Nyack, N. Y., has secured a 9½ acre tract overlooking the Hudson River for a high school site and athletic field. It is considered the finest school site in the state of New York.

—One of the recommendations made by Drs. Strayer and Engelhardt as a result of their survey of the school plant of Baltimore, Md., was that \$22,000,000 should be made available for the replacement of undesirable elements in the

existing school plant as well as for the construction of new buildings needed as a result of the growing enrollment in this city. In the school year of 1920-1921, \$7,000,000 was appropriated by the citizens of Baltimore as the initial investment in carrying out this recommendation. As a result of the recent November election, the citizens of Baltimore voted overwhelmingly in favor of a bond issue of \$15,000,000 in order to carry out all of the recommendations made as a result of the Strayer-Engelhardt Building Survey. This money will be utilized in pushing forward with rapidity the changes to be made in the school plant so that the entire school plant of the city of Baltimore may be placed on a modern basis. The survey report, the recommendations of which will be carried out through the means of this recent bond issue, has been published and can be secured from the press of the Albrecht Company, Baltimore, Md.

—The school board at North Plainfield, N. J., purchased 27½ acres of land for a campus and a new high school. The latter will cost \$300,000.

—Olathe, Kansas, is just completing a new gymnasium-auditorium. The building is 130 feet long and 72 feet wide, the first floor having showers and lockers and a large exercise room for classes, smaller rooms for hand ball courts and such games, and on the second floor a stage 30 by 60 feet and a playing floor of 100 feet by 68 feet. This building will be completely equipped.

How Norristown Got a Half Million.

The school system of Norristown, Pa., submitted a \$500,000 school loan issue for a junior high school election and won out three to one.

The school authorities went before the voters in three circular announcements. The first of these was headed: "Facts Concerning Your Boy or Girl" demonstrating that in order to provide a full school day for every child the additional fund was necessary. The second proposed a plan for relieving the crowded conditions of the schools. Incidentally it showed that while the average per capita tax collected in the cities of the United States was \$71, it was only \$10 in Norristown. The third and last appeal was based upon the necessity of preparing the boys and girls for the duties of life.

The campaign was in charge of a committee headed by superintendent H. O. Dietrick, chairman. The slogan adopted and which characterized the literature was "Vote Yes for the Loan."

OHIO CITY SCHOOL TAX LEVIES.

In placing an argument before the voters why the schools of Cincinnati, O., should have an increased levy of 50 cents on a thousand dollars of taxable valuation, the following table showing the tax levies for school purposes in eight Ohio cities was presented:

City	1921	1922	1923
Youngstown	8.02	5.97	8.58
Toledo	8.41	8.98	9.06
Dayton	10.43	9.96	9.51
Cleveland	10.08	9.59	9.62
Akron	10.42	9.15	10.10
Columbus	9.64	10.09	10.25
Canton	10.00	10.85	11.45
Cincinnati	8.02	6.53	7.11

TWO SCHOOL HOUSING SURVEYS.

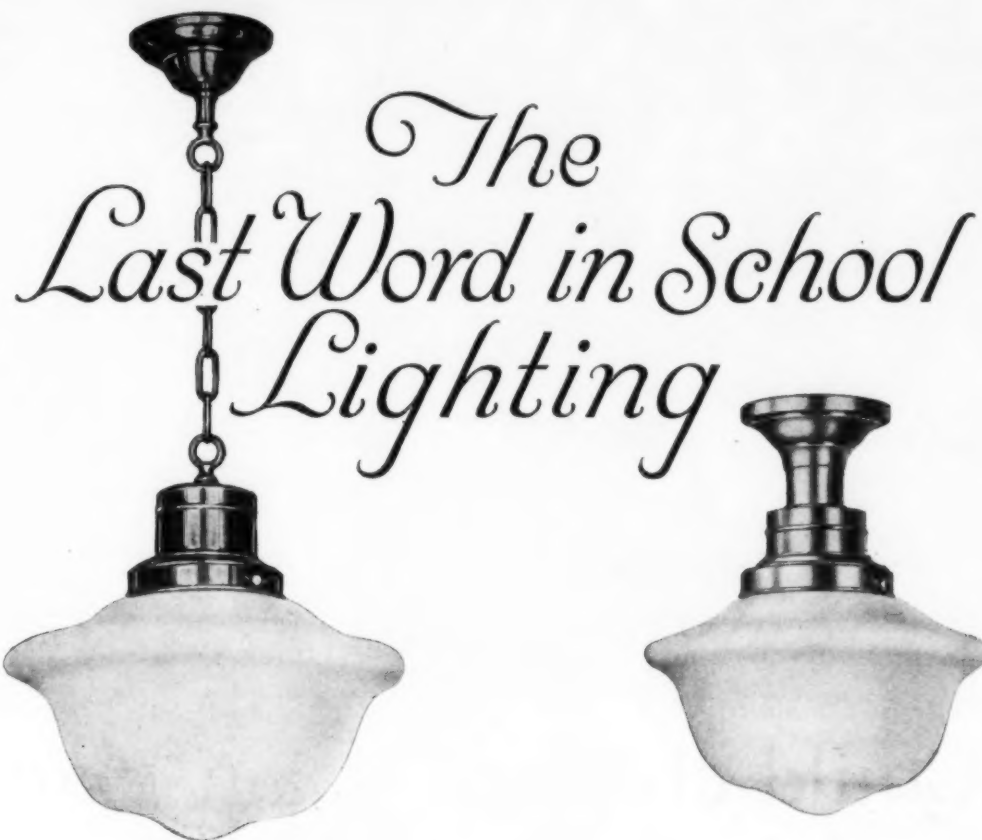
The school board of Portsmouth, Virginia has secured a school housing survey through Charles M. Robinson, an architect. This survey begins with charts showing the growth of the school population from 1910 to 1922 and then estimates the ratio of growth to 1930.

Then follows a map of the city which notes the residence of the school population showing localities in which the same is most likely to increase. At the same time the classroom shortages are enumerated in detail. After stating the essentials of a modern schoolhouse structure the report closes with a policy outline of future building operations that must be engaged in, in order to house the pupils in future.

A County School Survey.

The second survey, also made by Mr. Robinson, deals with Norfolk County and the city of Norfolk, Virginia. A series of three maps are supplied showing the general physical character of the territory covered, the zones and roadways, and the location of the schools and residence of pupils.

The report brings out the exact need for school seatings, together with an enumeration of the several periods from the immediate to the ultimate needs. Definite recommendations as to building programs, and schoolhouse essentials and standards are provided.



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The position of the lamp in the Trojan, the high diffusing quality of the glass, as well as the dimensions and contour of the unit, assure freedom from glare and objectionable brightness when the unit is used with the proper sizes of MAZDA lamps. The IVANHOE Trojan in the schoolroom today protects the eyes of the manhood and womanhood of tomorrow.

IVANHOE maintains a staff of lighting engineers who will be glad to work with you in redesigning your present school lighting or in laying out new installations. Our literature you will find helpful. Get in touch with your nearest IVANHOE distributor, or write to us direct.

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Could children sit on *your* schoolroom floors?

It is the practice in the more modern kindergartens to have the children sit on the floor, because in this position they feel more natural and because the newer type of play material is larger and can be more easily handled on the floor.

Perhaps your school will never adopt this practice. But you should keep cleanliness in mind. Plan to have floors which contain no splinters or splinters to get in children's shoes—floors which will always sweep clean—and stay smooth under wear.

Floor your new school buildings with Maple. It is the wood which outwears stone. Tough-fibred and tight of grain, Maple is not only smooth in the beginning—it becomes *smoother* because it polishes with use. Very naturally, such a floor brings the economy of long service.

For color—BEECH and BIRCH

Schoolrooms today are far ahead of schoolrooms of a few years ago. Everywhere you will find the tendency to make learning more pleasant by pleasant surroundings. And principal among the means employed is the use of waxed or varnished floors to create the atmosphere of home in rest rooms, kindergartens, and libraries. You get almost limitless color possibilities in Beech and Birch. These woods are akin to Maple in wearing qualities and readily take and retain a stain.

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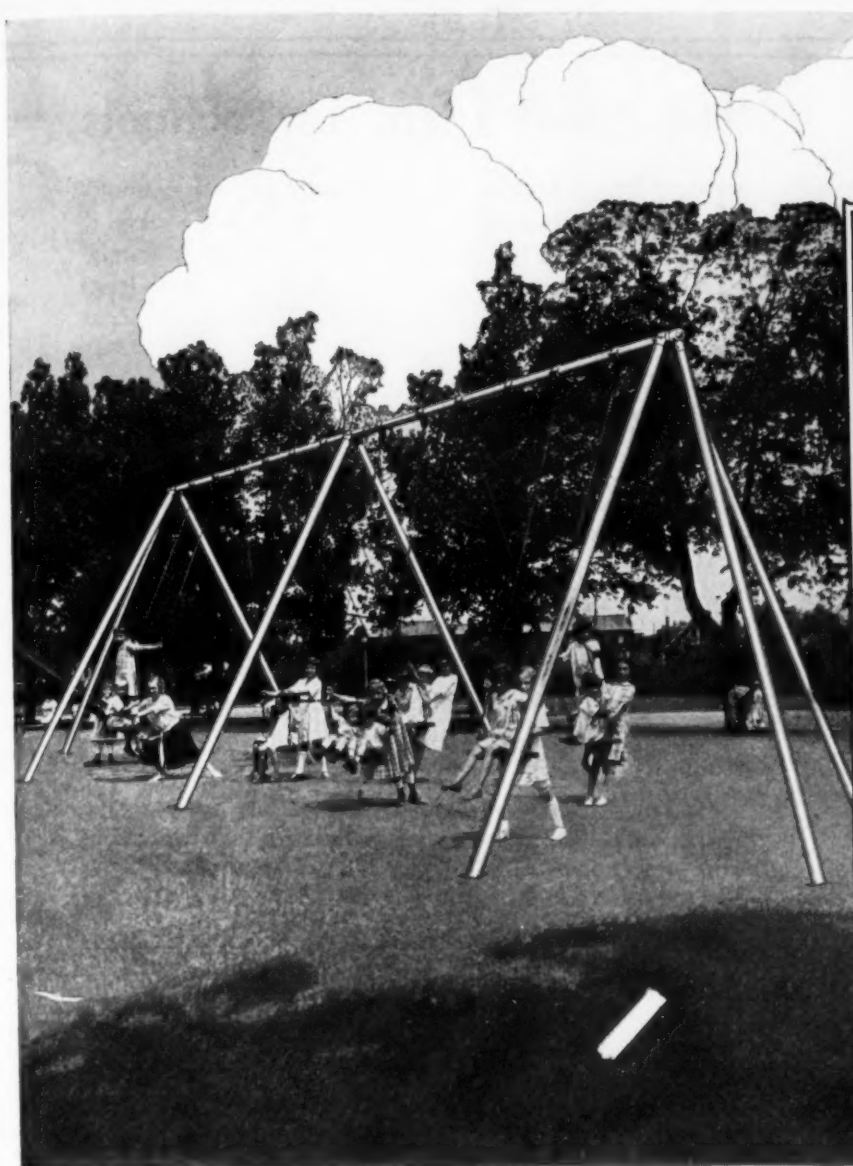
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Floor *with* Maple

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SCHOOL LAW

Schools and School Districts.

Under the constitution of the United States, amendment 1, and the constitution of New York State, art. 1, §3, guaranteeing religious freedom, and article 9, §§1-4, requiring free common schools, but prohibiting aid or maintenance other than for examination or inspection of any school or institution under the control or direction of a religious denomination, the state will not interfere with instruction in schools under the control of a religious denomination, where secular and religious education are combined, but it may not assist or aid in such instruction, directly or indirectly.—*Smith v. Donahue*, 195 N. Y. S. 715, N. Y. Sup.

The New York Education Law, §868, subd. 4, authorizing the board of education to furnish textbooks and supplies to all the children attending the schools of cities in which textbooks or other supplies were lawfully provided theretofore, does not authorize the board of education of Ogdensburg, which was authorized by the New York laws of 1903, c. 187, §§1-4, to furnish books to the schools with the approval of the electors, to furnish such books and supplies to pupils attending the parochial schools in the city, since the schools referred to are the public schools, and the "school" is not the building and its equipment, but is the organization, the institution and the teachers and scholars together, so that the pupils are a part of the school.—*Smith v. Donahue*, 195 N. Y. S. 715, N. Y. Sup.

A statute authorizing a board of education to furnish books and supplies to pupils attending the parochial schools would be unconstitutional, as an indirect aid, at least, to such schools.—*Smith v. Donahue*, 195 N. Y. S. 715, N. Y. Sup.

Under the Georgia laws of 1919, p. 326, §92, county board of education may change school district lines when in their judgment local con-

ditions make it necessary for the best interests of citizens and taxpayers affected and the majority of such citizens and taxpayers desire the change.—*Stephens v. Ball Ground School Dist.*, 113 S. E. 85, Ga.

A village in a public school district with a board of three members in which high school branches were taught and high school grades were available to pupils is held not a high school district within the Nebraska laws of 1919, c. 243, §6, providing for districting of all territory into districts for consolidated and high school purposes by a vote of the electors in the proposed district except where the proposed new district contains an organized consolidated or high school district which may be annexed on filing of petition.—*Wilhelm v. Speedie*, 189 N. W. 293, Neb.

School District Government.

While the trustees of an independent school district may employ counsel where the interests of the district require assertion or defense in the courts, they have no authority to employ counsel and expend funds in an attempt to secure or defeat legislation.—*Graves & Houtchens v. Diamond Hill Independent School Dist* 243 S. W. 638, Tex. Civ. App.

School District Property.

The board of education of a city school district may permit the use of public school buildings for public assemblages, and in rural school districts a majority of the qualified electors may, at any annual meeting, permit such use and fix the rental therefor, as provided in the Nebraska laws of 1915, c. 236.—*Brooks v. Elder* 189 N. W. 284, Neb.

School District Taxation.

Where a school district bond election was duly called and held under the Georgia laws of 1919, p. 288, on a petition signed by one-fourth of the registered qualified voters, the mere fact that the signers, or many of them, signed it upon the request of the trustees, did not render the election illegal and void.—*Stephens v. Ball Ground School Dist.*, 113 S. E. 85, Ga.

That two school elections had resulted against local taxation, and that a majority of the voters of the territory cut off by the county board of education for the express purpose of decreasing the number of votes against an issuance of bonds

were opposed to local taxation, or that the board refused to cut off another portion containing taxpayers opposed to issuance of bonds and desiring to be cut off, did not invalidate a bond election.—*Stephens v. Ball Ground School Dist.* 113 S. E. 85, Ga.

Under the Nebraska revised statutes of 1913, §6801, as amended by the laws of 1921, c. 66, §4, providing for the publication of a notice of a district bond issue election within the district for at least twenty days, is held directory merely, and not mandatory.—*State v. March*, 189 N. W. 283, Neb.

Where it appears that school district bond issue election was generally attended by the voters in the district, and that considerably more than the majority of all the voters in the district voted in favor of the bonds, the posting of the election notices, instead of the publication thereof, as required by the Nebraska revised statutes of 1913, §6801, as amended by the laws of 1921, c. 66, §4, did not invalidate the election; it being manifest that the result of the election could not possibly have been changed, had not all the electors voted.—*State v. March*, 189 N. W. 283, Neb.

Teachers.

In a teacher's action to recover wages following discharge, the question of whether the teacher had complied with his contract, or was guilty of conduct authorizing his discharge is a question for the jury in the case to decide.—*Urie v. Board of Education of City of Pryor Creek*, 208 P. 210, Okla.

In a teacher's action for salary following discharge before expiration of the term, the defendant board had the burden of proving that the teacher was guilty of conduct authorizing the board to discharge him.—*Urie v. Board of Education of City of Pryor Creek*, 208 P. 210, Okla.

A teacher dismissed by a board of school directors before the expiration of his contract without sufficient cause, is entitled to damages.—*State v. Preston*, 208 P. 47, Wash.

Pupils.

The directors of a school district have authority to determine whether or not the different children in the district are white or negro, and they are charged with the duty of providing a

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school for each class and assigning each child to the appropriate school.—State v. Board of Directors of School Dist. No. 16, Montgomery County, 242 S. W. 545, Ark.

Under the Crawford and Moses Digest, §8915, providing for the segregation of white and negro children in separate schools, the directors of a school district are not required to have a formal investigation or proceeding to determine their action in excluding negro children from a school for white children. It is immaterial how they received the information, but it is essential that they act reasonably on information in their possession.—State v. Board of Directors of School Dist. No. 16, Montgomery County, 242 S. W. 545, Ark.

The Nebraska revised statutes of 1913, §6944, empowering a school board to contract with neighboring school districts for the instruction of pupils when authorized by a two-thirds' vote of those present at any annual or special school meeting, are held to impose on the school board an absolute duty; the statute being mandatory.—State v. Stoddard, 189 N. W. 299, Neb.

LAW AND LEGISLATION.

—The report of the board of education for the District of Columbia recites the outcome of a suit brought against that body by a teacher because of dismissal. A teacher was appointed and assigned to a high school conditioned on her passing a satisfactory examination by the health department. When the health officer found her suffering with certain infirmities she was dismissed. Thereupon she filed suit for \$1,680, the salary she would have earned under the probationary appointment. The court decided that she had no claim and was subject to dismissal. The higher court affirmed the decision of the lower court.

—The school board of New Bedford Mass., has received an opinion from the city solicitor that the hiring and compensating of school coaches for athletic pursuits is entirely within its province and therefore legal.

—A mandamus action against the Fayette County, Ky., board of education to force that body to provide transportation for pupils was refused by the courts. The judgment of the court was that the board is vested with the power of discretion in the expenditure of school

funds, and that this discretion has not been abused.

CHICAGO SCHOOL BOARD SCANDAL.

For months former members of the Chicago board of education, who were convicted for contempt of court to prison terms and money fines, have dodged the clutches of the law. After these cases had travelled through court proceedings and court postponements the supreme court confirmed the action of the lower courts and ordered the consummation of the sentences.

Three of the women school trustees paid their fines and three of the male members served jail sentences ranging from one to three days. But a stay of proceedings was secured for Albert H. Severinghaus, a former school board member, and William A. Bither, the former attorney for the board. Two more former school trustees were indicted by the grand jury late in October.

Pending the grand jury investigation a body of school principals and teachers issued a communication accusing the press of "exaggerating the school scandals." Thereupon Chief Justice McKinley of the criminal court rebuked the critics holding that such efforts were designed to discredit the grand jury, the court, the prosecutors and all those connected with the investigation of the school situation.

CELEBRATE HUNDRETH SCHOOL ANNIVERSARY.

—The hundredth anniversary of the beginning of School District No. 13 at East Rochester, N. Y., was observed with appropriate exercises on December 4th, with programs at 2:15 and 8:00 P. M. Principal L. E. Bird gave an account of the early comers into the district and a group of high school boys reproduced the first annual school meeting. There was a reproduction of a scene from early days in the school and a lesson from the New England Primer from which the early school children learned to read. A feature of the entertainment was a tableau by children of foreign-born residents, who appeared in the native costumes of the fathers.

The school which today has forty teachers and more than 1,200 pupils was founded at a meeting in the town of Perinton, December 4, 1822. Throughout the years the identity of the

school has been maintained and the records of every school meeting are complete.

SCHOOL BUS TRANSPORTATION.

In view of the accidents that occur from time to time in the transportation of pupils to and from rural schools, county school officers are giving out warnings to their own drivers and to those in control of other vehicles.

In Tennessee recently a school bus was struck by a truck injuring one child seriously and in Mississippi was struck by a train injuring three children. These are simply a few accidents which have reached the metropolitan press. Many others have remained unrecorded.

Superintendent A. F. Harman of Montgomery County, Alabama, has issued a warning to truck drivers. "What happens to others, may happen to us," he says. "No accidents have thus far occurred in this county. Let us keep up the record."

A TEACHER CODE OF ETHICS.

The Cincinnati Teachers Association adopted a code of ethics recently out of which we reproduce that part defining its relations to school boards and the public, as follows:

It is the grave duty of the teachers to educate the public as to the fundamental importance of democratic education, and the needs and problems of the profession.

Teachers must emphasize the worth and dignity of their calling and maintain a progressive and enthusiastic professional attitude rather than a narrow, belligerent class consciousness.

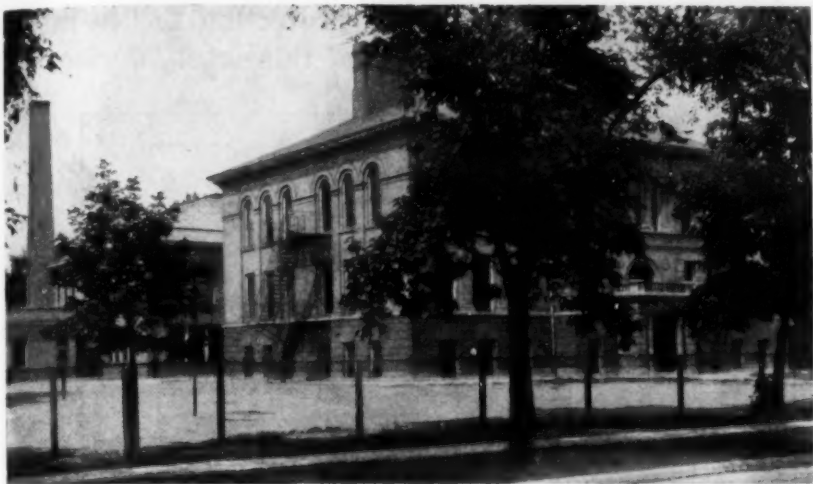
Teachers should recognize school boards as employers and superiors, but also as fair minded gentlemen and co-workers in education, unless proven otherwise.

It is essential to avoid any entanglement with, or acceptance of favors from, book companies or other forces commercially interested in our schools.

Individually and collectively, we have every right to advance strong protests or recommendations, but the important public nature of our service renders any recourse to a strike or walk-out indefensible.

Before signing any contract, individual teachers and the association should ascertain its exact meaning, and then live up to it implicitly, in letter and in spirit.

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for the school This 5 ft. high fence of Page Wire-link fabric and concrete posts gives a definite, secure boundary to the playground of this Oak Park, Ill., school.

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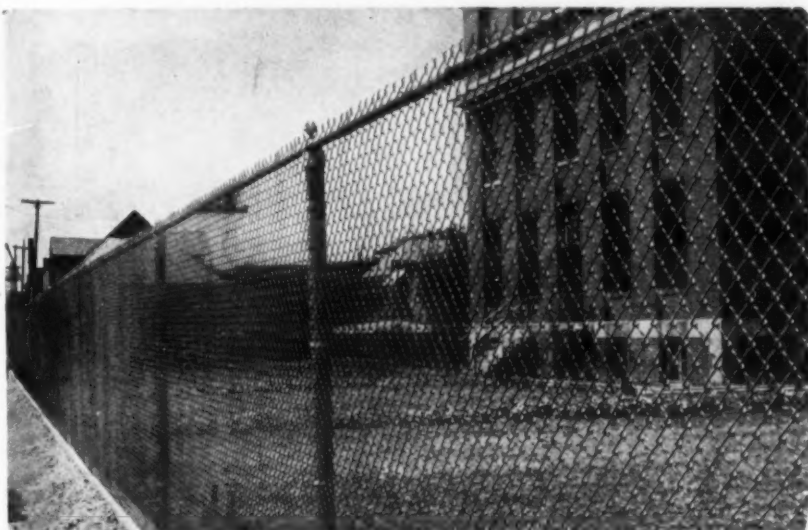
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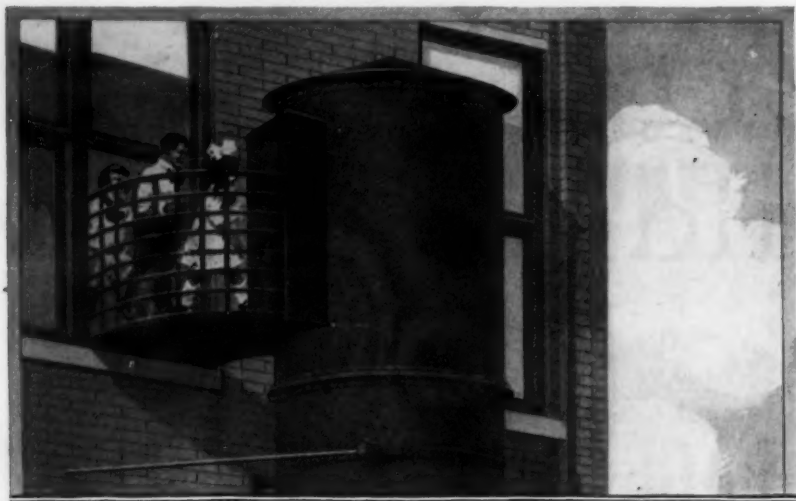


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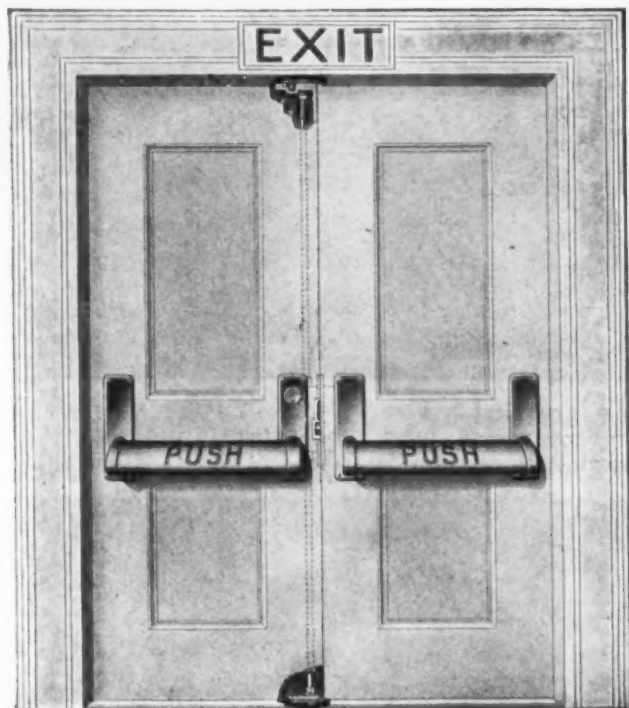
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as illustrated above, are attractive in appearance, strong in construction and quick in action. The construction is such that in operating the push bar the hands or arms cannot be caught between the bar and the door.

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SCHOOL ADMINISTRATION NOTES

SCHOOL ADMINISTRATION IN HAWAII.

The financial stringency which has troubled school administrators in many sections of the United States is also being felt in Hawaii. No schools have been closed on the island for want of funds, but the schools have been somewhat crippled on account of the lack of sufficient funds for the payment of salaries of an adequate number of teachers.

All teachers in Hawaii are appointed and paid by the Territorial Department of Public Instruction according to a salary schedule prepared by the department and approved by the Governor, etc.

The law relating to maintenance of school, providing for teachers' salaries, limits the amount of the monthly pay roll, that is, provides for a maximum pay roll. This law was amended by the legislature of 1921 and the law as amended came into force January 1, 1922. The provisions of the amended law reduced the maximum monthly pay roll for January below that of the four preceding months, so that it was necessary to drop from the pay roll a certain number of teachers.

"The funds for teachers' salaries are provided in this manner. All revenue is derived from the collection of the school tax (\$2 per capita of all male citizens) plus the necessary additional funds from the taxes on real and personal property," explains T. H. Gibson, deputy superintendent. "The superintendent must notify the treasurer, not later than fifteen days after the first of January each year as to the total amount required to pay the salaries of teachers for the ensuing year.

"This total amount is limited by the amended law to \$4.50 per capita for each child of compulsory school age (6 to 15) enrolled in the public elementary schools the preceding year, plus the number over the school age enrolled in the high schools. The amount so calculated is the monthly pay roll from January 1st to August 31st. For the last four months of the year an estimated increase of not more than 7.5% in the enrollment as a basis for calculation is allowed. The school year begins in September.

"In amending the law, the department asked for \$5 for each child enrolled, regardless of age. This would provide for kindergartens as well as the elementary and high school grades, it was thought; but it has later been found that high school pupils cost \$10 per capita on the average.

"The law relating to teachers' salaries, as originally framed, provided but two checks for the monthly pay roll—the salary schedule and the number of teachers to be continuously employed limited to one for every twenty-five children enrolled at the time of the highest enrollment. But no legislature or finance committee has yet been found who can be persuaded to adopt this simple plan. All the teachers who were dropped have been reappointed or their places filled by others since September, except in the normal and high schools.

"The department will have introduced at the next session of the legislature an amended bill asking for \$5 per capita for each pupil enrolled in the elementary grades, regardless of age, plus \$10 for each pupil enrolled in the high school grades—that will include junior high schools."

CHECK ON SCHOOL FAILURE.

A method of cautioning pupils against failure has been inaugurated by the De Witt Clinton high school, New York City by resorting to a series of slips.

This slip is to be handed out by the subject teacher whenever there are signs that the pupil is not doing his work properly and may fail for that reason.

Each recitation teacher is required to file with the chairman of department a failure slip for each failure in his recitation classes at the

end of the term. A slip should be started at the first evidence of the pupil's failure.

A pupil may be demoted to a lower term by the chairman after the sixth week. A pupil should not be dropped without the consent of the principal.

In case a boy refuses to sign this slip when required he should be brought to the principal at once.

I. I hereby acknowledge that I have received warning that my work in is unsatisfactory (subject, (class), is unsatisfactory in the following particulars:

I promise to notify my parents at once of this warning and I realize that unless I keep my work up to the passing mark I shall be required to bring my parent to interview my teachers concerning my work.

Signed.....

Date.....

Section.....

II. I hereby acknowledge that I have received notice that my work in the above subject is still unsatisfactory and that I have been notified to bring my parent within one week from date. I realize that failure to comply with the above notification will mean that my teacher will conduct me to the principal to be withdrawn from all classes until my parent has called.

Signed.....

Date.....

III. I, the parent of the above boy, acknowledge that I have interviewed the teacher in the above subject concerning my son's unsatisfactory work and that I realize that unless he keeps his work up to the standard of the school he may be: (1) Demoted to a lower term; (2) dropped altogether in the subject; (3) failed at the end of the term.

Signed (parent or guardian)

Date.....

IV. Notwithstanding the above warning, according to my best judgment, the above pupil has not come up to the standard of the school, and is therefore failed.

Signed (recitation teacher).

Mid-term mark—Dropped (date).

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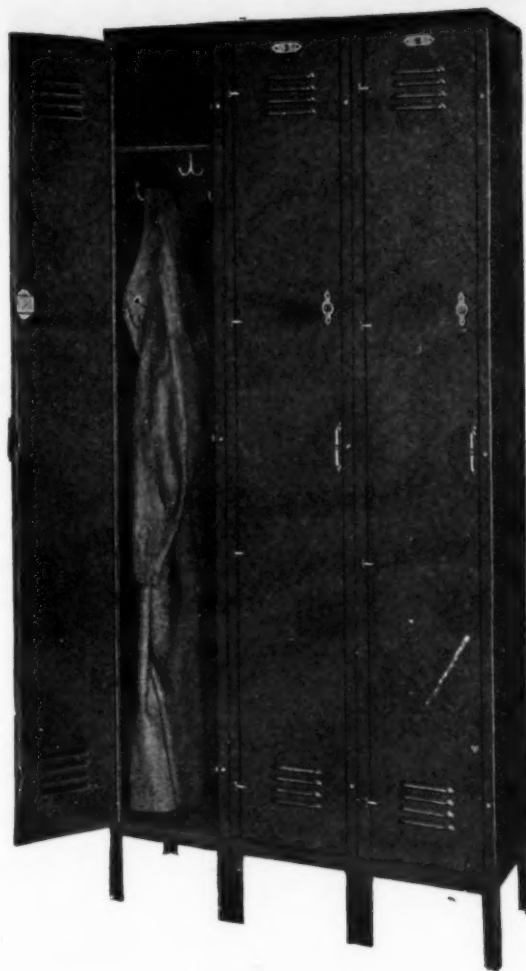
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Examination mark—Demoted.

Final mark—Failed (date).

In the very exceptional case when a pupil is failed who has received no warning the teacher is required to file a detailed statement concerning the cause of the failure.

A Study in Teachers' Marks.

A study of the distribution of teachers' marks in the Junior-Senior High School was recently made at Waukesha, Wis., as a means of securing greater uniformity in grading pupils' work. The system of marks used is unique, there being two parts, a letter and a figure, i. e., 7b, 8c or 9a. The letter stands for the teacher's estimate of the pupil's attitude and effort. The letter A means the pupil is doing his best, the letter B means he is working fairly well, C means he is trying very little, and D means he does not work. The figure is a measure of the quantity and quality of the work accomplished. It corresponds to the old percentage system, that is, the 9 equals about 92 per cent, 9 plus about 95 per cent, 10 equals about 98 per cent, and below 7 means a failure grade.

In the study, each teacher was given a number. The marks given by each were studied with the results indicated in the report submitted. The purposes of the study were to place before the teacher the average tendency, to determine the extent of the failures, and to offer the teacher a guide to the number of exemptions. The total number of marks considered amounted to 4,603. The median grade in the study was 81.65 and the normal probability median was 82.5. In the distribution of grades and the relation to normal probability curve the following results were indicated:

Mark	Per Cent Receiving (1922)	Normal Per Cent	Per Cent Receiving (1921)
10	.8	2 to 3	1.3
9 plus, 9, 9—	21.8	20	23.3
8 plus, 8—, 8	43.3	45	41.4
7 plus and 7	25.8	25	23.6
Failure	8.3	7	10.

It will be noticed that the distribution of grades follows very closely the normal probability curve. A few of the very best pupils might be awarded with 10, that is, about two more out of every hundred. Some of the "7" students

might become "8" students, and a few failures ought to become "7" students.

In the distribution of letters, the following facts were noted:

Marks	Per Cent Receiving (1922)	Per Cent Receiving (1921)
A	32.4	47
B	56.2	44
C	10.9	8
D	.5	1

There is no method of knowing whether this is a correct distribution. The average judgment of the teachers was that about one out of every three students was doing all that could be expected and therefore should be exempted from semester examinations. Probably the teachers might work out collectively a definition of the effort required for each letter. Pupils know that teachers vary in their markings and that an effort might give them an A in one class or a B in another class. The comparison with 1921 is interesting but not altogether helpful.

In studying irregularities in teachers' marks, the maximum average and minimum per cent of various marks given are indicated in the following table:

	Maximum	Average	Minimum
A	71	32.4	.7
9	58.2	21.8	0
Failure	30	8.5	0

Reading the table the marks show that one teacher gave 71 per cent of the pupils "A", another teacher gave .7 of one per cent, while the average teacher gave 32.4. In determining the range of median grades, it was found that the median of one teacher was 89.4, that of another was 74.2, while that of a third was 81.65.

Subject	Median Mark	10	9	8	7	Below	A	B	C	D
All Subjects	81.65	.8	21.8	43.3	25.8	8.3	32.4	56.2	10.9	.5
English	80.4	.2	16.1	44.3	29.2	10.2	36.	49.3	13.5	1.2
Commercial	85.	.3	36.8	43.2	13.9	3.8	39.2	57.4	3.4	
History	80.4	.0	12.6	48.9	31.7	6.8	35.4	52.	12.2	.4
Home Economics	85.7	.0	36.2	61.2	2.6	.0	37.5	54.	8.5	
Manual Arts	83.5	.4	19.3	67.3	10.6	2.4	37.4	55.9	6.3	.4
Mathematics	78.9	.1	20.5	31.3	31.9	15.3	26.4	65.	8.4	.2
Hygiene	82.6	2.3	28.	36.6	26.9	6.2	31.6	45.	21.9	1.5
Science	82.2	2.1	24.1	41.	25.3	7.5	26.9	61.6	10.9	.6

In studying the distribution of marks by subjects the following table gives some interesting facts:

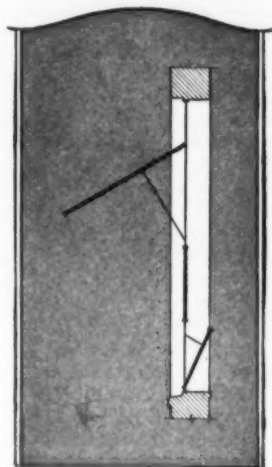
The study brings out the facts that vocational subjects make the best showing, that mathematics has the lowest percentage of "A's", while probably the average student spends fifty per cent more time on mathematics than on any other subject. It is shown that 11.4 per cent of the students do not work even reasonably well. In a comparative study with previous years, considerable data were produced but the results have little value for the administrative staff since the teaching staff has changed.

SCHOOL ADMINISTRATION.

—The Nutley, N. J. schools, under the direction of superintendent Paul R. Ratcliffe, have inaugurated the departmental system in the Lincoln grammar school, including grades five, six, and seven. The fifth, sixth and seventh grades of the Lincoln elementary school have been placed on a departmental program with special teachers for the individual subjects. The organization of the junior high school group comprising grades seven, eight, and nine is in process of completion. These grades have been departmentalized, teachers have been placed in charge of individual subjects and the courses of study are being written with a view of meeting the capacities, needs and interests of the individual groups.

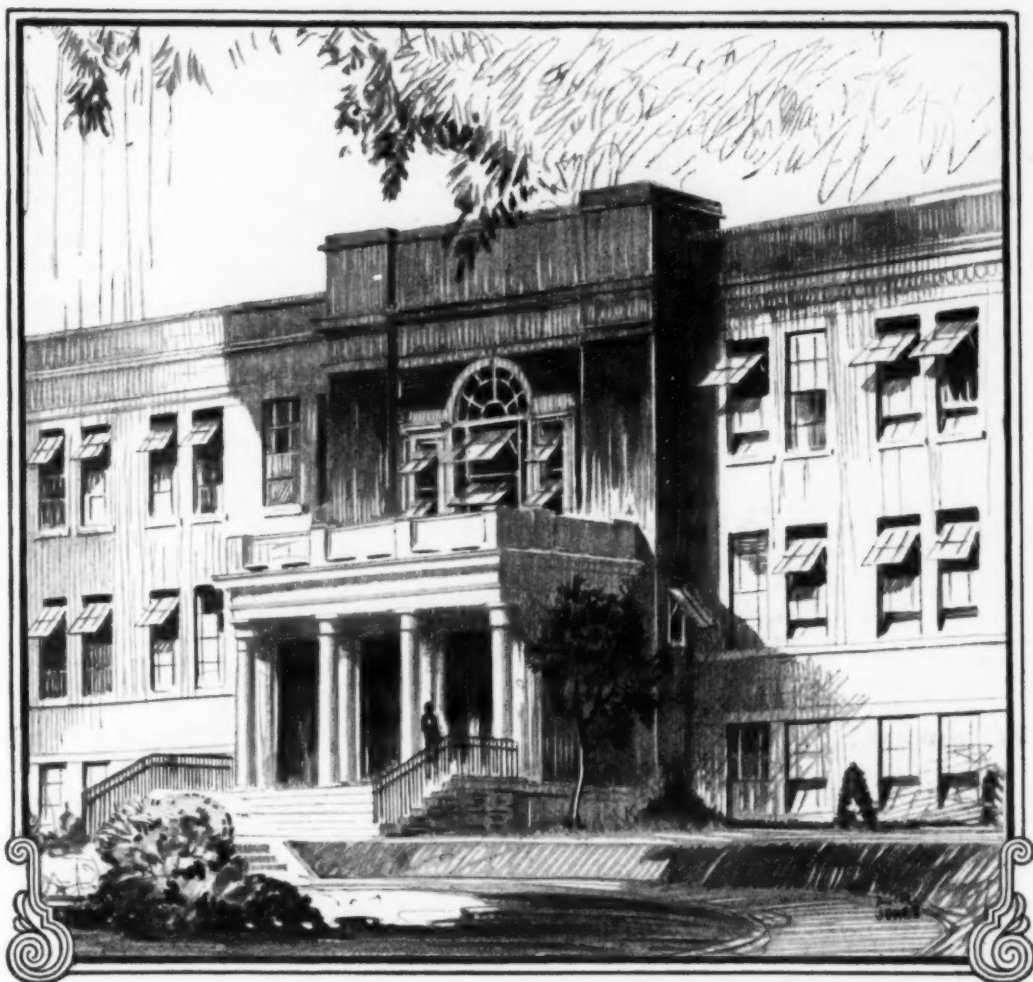
—Supt. E. E. Lewis of Rockford, Ill., recently completed the plans for a comprehensive building program to be carried out at Council Bluffs, Ia. Mr. Lewis had previously worked out the plans for a building survey made some four years ago.

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MEASURING A RECITATION.¹

Mr. C. L. Wilson, superintendent of schools at Rankin, Pa., has recently devised a measuring scale to be used in measuring the work of the teacher in conducting a recitation. The scale takes into consideration the substance and the mechanics of the recitation and brings out a number of pertinent facts by means of which the success or failure of the classroom work is assured. It is clearly evident that the teacher's influence has a strong bearing in the matters of example, motivation, memory training and discipline.

The scale, which is divided into three sections, is as follows:

The Pupils—Mechanics of Recitation:

1. Are pupils' hands and faces clean, and is their hair brushed?
 2. Do pupils, from habit, assume fair standing and sitting postures?
 3. Is their expression (English) reasonably fair in quality, showing results proportionate to the number of previous year's school training they have had?
 4. Is their pronunciation of all common words good, and of uncommon words and proper names at least fair?
 5. Is their enunciation distinct?
 6. Does their diction show that they are at least aware of the desirability of a suitable choice of words?
 7. Are their voices good and clearly audible? Are there several voices that could be called pleasing?
 8. Was adequate use made of blackboard, maps, charts, outlines, measures, real objects, actual forms, flash cards, drill material, etc.?
 9. Was much time consumed in the movements of pupils, books or materials, or were such movements well planned and executed?
 10. Were the contents and limits of the lesson clearly understood by pupils?
- #### The Pupils—Substance of Recitation:
11. Are pupils' words a mere "re-citation" of the words of the book, or is their expression largely, at least, their own?
 12. Are pupils developing a personality—i. e., do they show evidence of training in the development of their own initiative and responsibility; and do they courteously question and answer one another?—or does the teacher "overshadow" this by directing most of the pupils' activities or suggesting much of their thinking and replies?
 13. Is there evidence of independence of thought on the part of pupils?—i. e., do they offer statements or ask questions, upon matter pertinent to the recitation and of value to it?
 14. Is there any contribution from special, collateral or individual study—of other texts, magazines, personal investigation, etc., or are they wholly from one common class text?
 15. Do the pupils do most of the talking?
 16. Did all, or most, of the pupils recite—or did a few "shine"?
 17. From the standpoint of satisfactorily covering the essential points in the assignment did the lesson close with a feeling of success?
 18. Was connection made with the substance of yesterday's or preceding lessons?
 19. Was there evidence of (1) organization of subject-matter and (2) definite plan of recitation?
 20. Was the recitation held reasonably close to the substance of the prepared lesson, or was there much talking about non-essential or unimportant details?

The Teacher:

21. Was the teacher's example in the quality of English, pronunciation and enunciation, good cheer, courtesy and self-control a good model?
22. Were "thought questions" and topics con-

¹If percentages are desired, rate each question as four.

- spicuous in the recitation—or were they crowded out by "memory questions"?
23. Did the assignment of the next lesson make suitable preparation for its difficulties and relative values?
24. What "motivation" was made for studying the next lesson? Did some "bait," challenge "get across" to pupils in a way to make them want to attack it?
25. Had any of the teacher's time and attention to be diverted to discipline *per se*, or was all needed discipline secured through the recitation itself?

CRITICISING THE TEACHER.

I have read with interest a good many articles in the SCHOOL BOARD JOURNAL. Many of the discussions touch closely upon the work. The teaching profession is one that needs these things brought to light.

It has often occurred to me that we teachers are criticised more than our share. We hardly ever suit exactly, but taking it on the whole, I am inclined to believe we come as nearly doing what is expected of us as any set of people engaged in public or semi-public work. I have usually rushed to the defense of the teacher. Of late, however, I have somewhat reluctantly come to the conclusion that there is some truth in two faults that are being pointed out in teachers.

Recently, at a party in our town the president of a local bank expressed the hope that we would soon hire teachers on their merit and that salaries would be graded accordingly. He said he had about decided teachers should be paid less. I went into the matter with him. For a number of years he argued that he had noticed that, regardless of how much salary they received, teachers were nearly always broke by spring and that he had usually had to loan them money to go home on. Last year he loaned a country teacher here money to buy a fur coat on the installment plan. This coat was of a quality and price which no one should think of wearing to a country school every day.

Not so long ago the lady teachers put on a light opera and were obliged to dress in wooden shoes. It turned out that not a single one of them had cotton stockings. All had only expensive silk hose, not appropriate for a Dutch dance. At the same time this group of teachers had a petition before the school board asking for an increase in salary. Needless to say the board thought the two conditions rather inconsistent.

Complaint is often made that pupils feel ashamed to wear poorer clothes to school than they now wear because the teachers dress too well. I think this is a little far-fetched because as a usual thing there are several pupils in every school who set the pace in the matter of dress regardless of how conservative teachers are.

There is a point in the matter though that should not escape those engaged in the profession: Very few teachers save any money at all, and even when they receive more salary, they make no conscious effort to save. I have observed those who have taught under me and, it seems to me, that only three of the women teachers have ever really saved money. One of them did it when teachers received \$70 a month and paid \$30 of it for board and nearly as much for a suit as now. It is fast putting the idea into the heads of people that no matter what is paid a teacher, she will spend it all and that she had better be paid less. People are again saying that teachers are the only well paid people and they continually point to the way teachers live and dress.

Now, I am not blind to the fact that much of this criticism would exist regardless of how we act, but I do believe the younger lady teachers are extravagant if not foolish sometimes. They usually spend their first few pay checks almost as soon as they receive the money, and most of it goes for clothes and things they do

THE LEVEL OF EDUCATION.

The sentiment that the time involved in securing a higher education is wasted, which was quite common not so many years ago, does not exist any longer; and partly as a result of this and partly from other causes, the level of education is constantly rising. There was a time when a person who could read and write had attained the common level of education; following that period, a person who had gone through the grammar school had reached the common level. Now it is the high school.—Dr. George Wheeler, Assistant Superintendent of Schools, Philadelphia.

not have when they start out. I realize that girls wish many things which they are unable to have while in school, and that this is often the first money they have ever earned. They feel they must have those things. It seems only proper, though, that a little moderation would be helpful to the profession.

There is another criticism that goes even deeper: the behavior of teachers outside of school. I am sometimes much shocked and annoyed by their indiscretions. I have gone to a good deal of trouble to arrange receptions, get good rooming places for teachers and arrange for them to meet the best people in town. I realize that they are away from home, often for the first time, and that they are not in position to choose wisely. I have often been sorely disappointed.

I have had young women begin keeping company with very undesirable young men, almost from the start. Oftentimes they were warned of this in a gentle manner that should have caused them to take notice. I have had them go out with high school boys until it became not only school but public gossip. Too many times they are resentful when it is called to their attention that this is not proper. That always makes a bad state of affairs.

In my experience I have had teachers who were actually crooked in their business dealings and who would not or could not do the square thing even in the schoolroom. Fortunately these are rare, but they do exist.

I would not be inclined to the point of view that all we hear along these lines is true. I am simply writing this in the hope that some of those who are training teachers may take it upon themselves to correct some of the habits of those who are sent out to teach.

Teachers should take into consideration the fact that when they apply for a teaching position they are anxious to bring before us all their good points. They usually indicate their interest in church and community life. When they arrive they should back up these claims by their daily lives. When they fail signally in these lines it is only natural that people should consider them failures as guides of youth.

I do not believe that teachers should be compelled to surrender their independence or individuality but I am inclined to question Sunday night card parties and promiscuous "gadding."

A "SMALL TOWN"
SUPERINTENDENT.

Nov. 1, 1922.

SCHOOL ACTIVITIES OUTSIDE REGULAR WORK.

The board of education governing the Kentland and Jefferson, Indiana, township public schools has issued its general regulations from which we quote the following sections governing activities carried on outside of the regular school work:

1. Beneficial school activities so long as they do not interfere with good school work, and so long as they are conducted properly, will be encouraged and aided by the school.
2. All such activities must be by permission only and must be supervised by a teacher or some other qualified person.
3. The school is absolutely not responsible for any so-called school activities given elsewhere than on the school area. Teachers present at such functions do not represent the school.
4. The name of the school or of any class shall not be used by any class or persons giving entertainments, parties, or dances, at any place other than in the school buildings. Credit will be withheld from any pupils violating this regulation.
5. Teachers are requested not to chaperone parties not given in the school buildings. If they do the school is not responsible for the same.
6. Each class is required to select a sponsor from the teachers who is responsible for the activities of that class. No class meeting or activities of the class of any kind shall be undertaken without permission, advice and presence of the sponsor.
7. School buildings will not be used longer than 11:00 P. M. without special permission from the superintendent.
8. School parties, games, plays, and all other outside activities must not be arranged for Monday, Tuesday, Wednesday, or Thursday evenings without permission from the superintendent.
9. Pupils are requested to refrain from entertainments four evenings a week. The first four evenings in the week should be used for study as no pupil can do all the required work at school.



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See also Sweet's Catalog, Pages 266-267.

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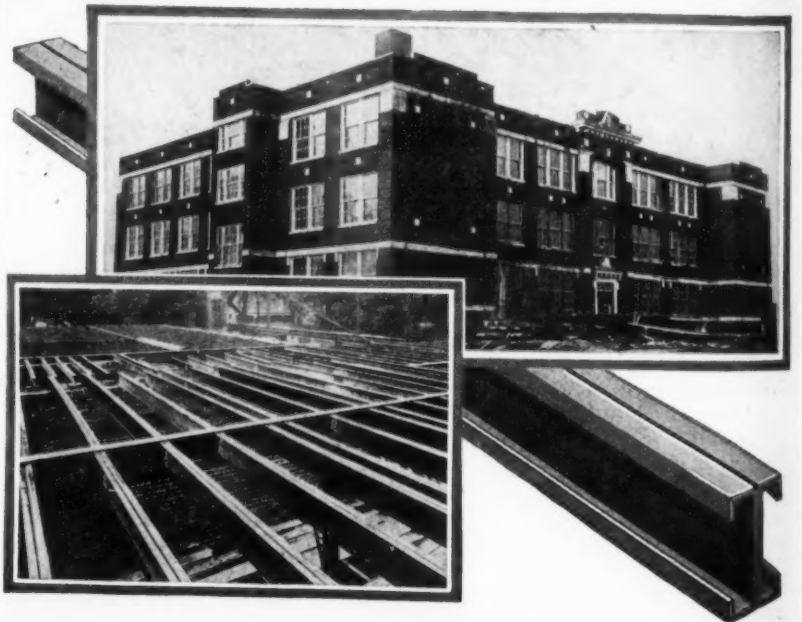
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TEACHERS AND ADMINISTRATION.

—San Diego, Calif. The board of education has adopted an amendment to the rules governing teachers' absence. The amendment reads:

In case of absence of teachers from duty on account of illness, principals may certify for a single day but certification in writing by a licensed physician that the teacher was unable to perform her duties must be filed with the report of "teachers' time" in all other cases.

Where time is lost under certification, the teacher may receive full pay for the period of absence not to exceed ten days in any school year.

Three days' absence on full pay will be allowed at the time of death of any member of the immediate family, including parent, child, grandparent, husband, wife, brother, sister, uncle or aunt. Certification for the absence must be made by the principal. In no case may more than ten days' pay be allowed.

—Mount Vernon, N. Y. Every teacher, supervisor and superintendent has become affiliated with the local teachers' association, the county teachers' association, and the state teachers' association.

—"The school boards of the state like exceedingly the fair and blithesome flapper. Why should a sleek and well-fed teacher in Los Angeles be protected by the tenure law and not the remotest old teacher in the remotest canyon of our state?"

This was the statement of Mark Keppel, president of the California Council of Education and Los Angeles county Superintendent of Schools, in speaking of the legislative changes of the tenure law before the eleventh annual institute of the bay sections council of the California Teachers' Association at Oakland recently.

Regarding the retirement salary bills, Mr. Keppel said: "The law is inadequate. I believe in making a fight for what we ought to have, whether we get it or not. Teachers need a grievance committee. The lawyers have one."

Keppel protested against the discrimination by school boards against women who have passed their period of beauty, and said that a revision of the present tenure law was the only solution of the problem. The hardest fought

bill in the coming legislature, according to Keppel will be the teacherage bill. Teacherages at present, he declared, are as much in violation of the law as bootlegging and pointed out that a teacherage bill was passed by the last legislature, but that the Governor did not sign the measure.

—The board of education of Highland Park, Mich., two years ago, set aside \$1,000 to be administered by the superintendent as a teachers' revolving loan fund on which no interest was to be charged. The report for the period from September, 1920 to August, 1922 indicates the extent of the loans and the good it has done. The total number of loans was 235 and the total amount loaned was \$17,394. The total length of the loans was 39 years, 6 months, and 7 days and the average time of the loan was two months and one day. The largest loan was \$450 and the smallest amounted to \$5. The longest loan was for one year, six months and eight days, while the shortest was for one day. The total amount on hand on September first was \$201.90. While the benefit derived by the board is not measurable, it appears that the value of the cheerfulness, unconscious loyalty and other things secured by the operation of the fund has come nearer to the value of \$17,000 than the \$40 sacrificed in interest money.

—Worcester, Mass. The school board has approved a plan calling for the elimination of the minimum passing mark in the examination of elementary teachers for prospective positions in the schools. Under the present system, no teacher who obtains a mark below 75, is entitled to a place on the list of eligibles. The change means that the names of all teachers will be placed on the eligible list irrespective of the marks received in tests.

The elimination of the passing mark requirement, it is pointed out, does not lower the standards of teachers entering the service. It provides an opportunity for some teachers whose marks are below the present requirement, to obtain appointments in the schools, provided their experience in other cities has proven their teaching to be satisfactory.

—Tamaqua, Pa. The school board has been obliged to employ married women as teachers

to fill several vacancies in the schools. The fall term opened with all teaching positions filled but later six teachers resigned to take positions elsewhere. As a result there were vacancies which the board was unable to fill without the aid of the married women.

—The New York City Teachers' Association has gone on record opposing the proposal of the board of education to lengthen the day of teacher-clerks to eight hours. A resolution proposing that the association recommend that the board amend the proposed bylaw to a seven-hour day, inclusive of lunch, was carried with one dissenting vote.

TEACHERS' SALARIES.

—Boston, Mass. Women school teachers, at the recent election, won their referendum for equal pay with men employed in the same duties. The teachers' petition was won by a scant 3,000 votes, the figures being approximately 70,000 in favor and 67,000 against.

—The salaries of high school teachers in Seattle, Wash., are \$34 below the annual average of 26 cities, while grade teachers' salaries are \$201 greater than the general average, according to figures compiled by Mr. Louis Staude, comptroller of the school district. Charts prepared by Mr. Staude based upon a survey of cities having a population of 200,000 to 1,000,000, show the average annual high school salary is \$2,212. In Seattle it is \$2,178. The average grade salary is \$1,710, while in Seattle, it is \$1,911.

The maximum high school salary in Seattle is \$2,400. Seventeen of the 26 cities have higher maximums, that of Newark, N. J., being the highest with \$3,800. Of the 300 Seattle high school teachers, only 106 or 33.1 per cent of the group, have the maximum rating. Seven of the 26 cities have a higher per cent drawing the maximum than Seattle.

Seattle has 1,003 grade school teachers, of whom 454 receive the maximum rating, \$2,100 per annum. This maximum is exceeded by four among the 26 cities, Cleveland having a maximum of \$2,400, Denver, \$3,080, Milwaukee \$2,400, and Newark \$2,700.

In Seattle the minimum paid grade teachers is \$1,500. Detroit and Oakland have the same

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minimum. None of the 26 cities has a higher minimum, the range being from \$1,000 to \$1,500. Columbus, New Orleans and Providence pay the \$1,000 minimum.

—Washington, D. C. A new system of rating teachers, designed to improve teaching in the District schools, has been proposed by a special committee on teachers' ratings in a report submitted in November to the teachers' council. Favorable statements on the proposed change in rating have been made by a number of delegates to the council and it is expected that the report will be finally adopted.

The report recommends that teachers be graded as follows at the end of each year:

"S, superior; E, excellent; VG, very good; G, good; F, fair, and U, unsatisfactory.

"A mark of fair shall be interpreted as a passing mark, but shall subject the teacher receiving it to intensive supervision for the following year. A mark of unsatisfactory shall be equivalent to a recommendation for dismissal.

"Teachers shall be graded under the following heads and shall, in addition, receive a general grade expressing the final judgment of the supervising officer.

"1. Teaching and class work.
"2. System, order, promptness, care of material, attention to heating, lighting, ventilation and hygiene.

"3. Self-improvement, civic spirit, participation in school and local activities.

"4. Health (excluding artificial standards of under and over weight), cheerfulness, liking for human beings and tolerance.

"5. Applied knowledge of related subjects.

"6. Initiative, personality, inspiration, creative force, school betterment, high potential value to schools.

Requisite for High Rating.

"Teachers who stand very high in all of the first five classes shall be marked excellent.

"Teachers who stand high in four of the first five classes and do good work in the remaining class shall be marked very good.

"Teachers whose work is good, but not excellent, in the first five classes shall be graded good.

"Teachers who are, in the main, doing fair work, but who show indications of weakness in

some of these five classes, should be marked fair.

"Teachers recommended for dismissal shall be marked unsatisfactory. Before such unsatisfactory grade shall be effective as a basis for dismissal it must be verified by two other supervisory officers for a period of at least one semester.

"The few teachers who are excellent in the first five classes and who also excel in the qualities of class 6 shall be rated as superior teachers."

—Officials of the Ohio State Education Department have made a study showing that the salaries of teachers in the state have not increased sufficiently since 1919 to be in excess of the cost of living. The average salary for teachers this year was estimated at slightly less than that received one year ago.

In 1919 and 1920 the salaries of teachers amounted to approximately \$31,125,687 and in 1920 and 1921 they involved \$43,753,585. This raise was allowed to keep pace with the high cost of essentials. In the nation as a whole in 1920, the average annual salary of teachers was \$871, an increase of 69 per cent over the salary of 1913. Figures were produced showing that the cost of living had increased one hundred per cent between 1913 and 1920. In 1920 the teacher's dollar was still less than 85 per cent of what it was in 1913.

Figures compiled by the department of education show that in 1921 the average annual salary of state rural teachers was \$922, while the salary today is slightly less. According to State Supt. Riegel, the amount paid out at the present time for salaries takes half of the school revenue, which in 1920 and 1921, came to \$87,010,614.

MONTANA EDUCATOR OBJECTS.

In the November number of the American School Board Journal on page 66 an article entitled "The Western School Man as a Type" was published which meets with some objections on the part of F. L. Cummings of the Fergus County high school, located at Lewistown, Montana.

The article in question states that "it is interesting to note that Montana also ranked first in the point of teacher's salaries." This Mr.

Cummings holds as being incorrect. He says: "Any one who has ever read the Ayres' report knows that Montana ranks fifteenth in point of teachers' salaries."

The Kerr article also contains the following paragraph: "The old idea that a school superintendent must appeal to the pupils as one immune from any of these human weaknesses as an example for them to follow has been exploded. The father who has imprinted his character on the life of his young son more than any one else can hardly expect a stranger, through a schoolman, to exemplify a higher standard before his children than he himself has done."

Mr. Cummings comments on this in the following manner: "Those in touch with the situation know that such ideas are not held by a large majority of the western schoolmen. In fact, we would have a mighty bad type of citizenship if the school superintendents did not have better habits and better ideals than the majority of fathers. There would be little progress toward high ideals if such school superintendents and teachers were not able by precept and example to instil higher ideals into the boys and girls under their instruction."

Mr. Cummings also says: "Colonel Ayres' report as it stands has harmed Montana's school system more than it has ever benefited it."

Hundredth School Anniversary.

The first public school of East Rochester, N. V., was founded at a meeting held at the home of Caleb Fowler in the town of Perinton, December 4th, 1822. The first money collected was \$17.51 which went to pay the teacher's salary for a year. The sum of \$20 was voted to fit up a room for the school. Wood was furnished by each family, according to the number of children in school and the acceptance and measurement of the wood was left to the teacher. If it was not delivered by the first of January, following, an assessment was made against the family at the rate of 65 cents a cord.

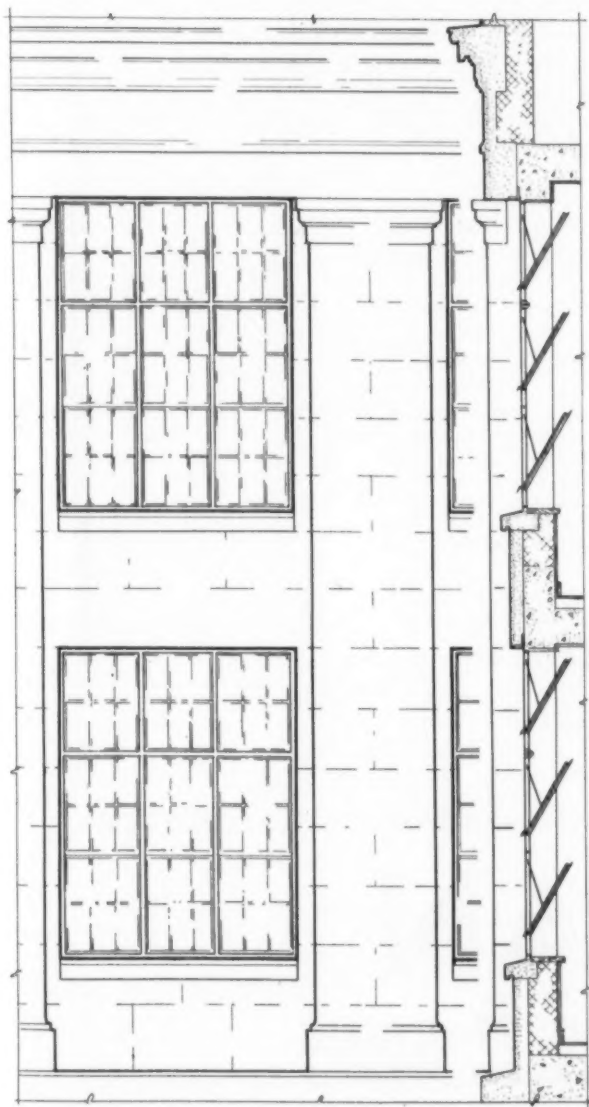
The anniversary was celebrated by the whole town. All the former students now alive participated. Today the district has twelve hundred pupils and forty teachers. Among the features of the celebration were addresses by H. R. Worden, president of the school board on the hundred years of progress.



Washington-Gladden High School, Columbus, Ohio.

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“Every School Building Should Be a Hall of Health” — Wm. B. Ittner, F. A. I. A.



Elevation and section of typical window bay in Washington-Gladden High School. Notice the Truscon Balanced Ventilators swing in, affording 100 per cent ventilation.

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From “The School Plant in Present Day Education”
By Wm. B. Ittner, architect and school specialist.
Architectural Forum—August, 1922.

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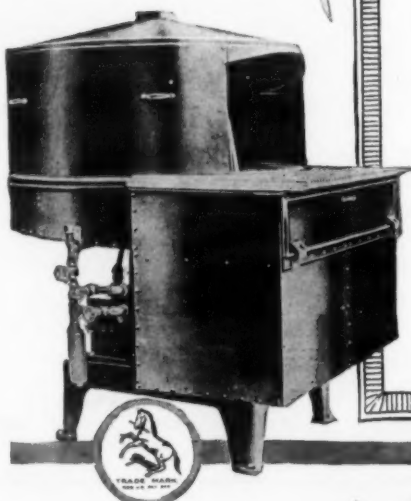
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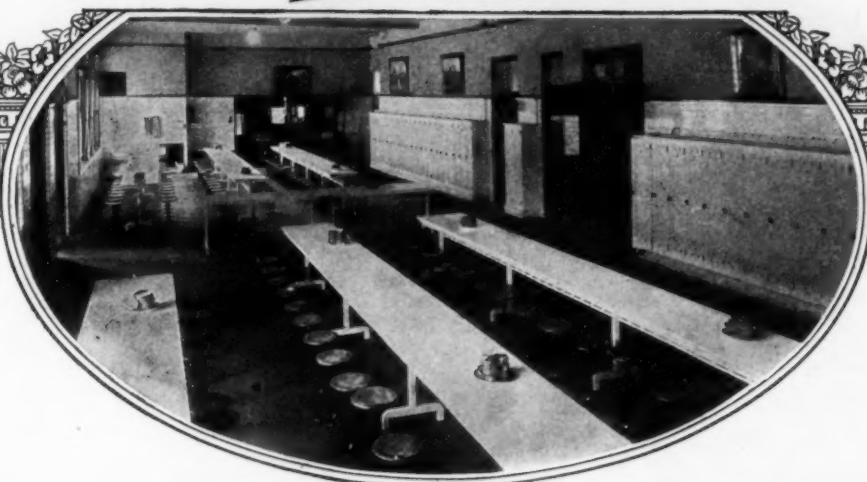


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matter what you spill, a damp cloth will remove it instantly. *Sani-Metal* Table Bases are made of special metal, heavily coated with porcelain enamel. There are no crevices for dirt and grease to collect. Wet brooms and mops which are so injurious to the ordinary varnished kind, have no effect on *Sani-Metal*. A school lunchroom is a permanent investment and requires permanent equipment. We have it.

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PERSONAL NEWS OF SCHOOL OFFICIALS

AMONG SUPERINTENDENTS.

—B. W. Bardwell, superintendent of Woodstock, Ill., heads the northeastern division of the Illinois Teachers' Association.

—Mr. R. N. Young, formerly principal of the high school at Stillwater, Minn., has been elected superintendent of schools. Mr. Young succeeds J. C. Davies who has resigned.

—Mr. E. C. Witham, formerly superintendent of schools at Putnam, Conn., has accepted the position of Director of Research for the public schools at Wilmington, Del.

—Supt. S. S. Dickey has been reelected head of the schools at Berea, O. Mr. Dickey is one of the youngest superintendents in northern Ohio.

—Miss Elizabeth Russum has been elected State Superintendent of Public Instruction for Idaho.

—Mr. Charles S. Jackson, superintendent of schools at Lynn, Mass., has announced his retirement to take effect in January. Mr. Jackson has served the schools as high school principal and superintendent for 32 years.

—Supt. M. C. Lefler of Lincoln, Neb., has been reelected for a term of three years, at a salary of \$6,500.

—Mr. B. F. Schafer, for the last two years principal of the high school at Jacksonville, Ill., has been elected superintendent of schools. Mr. Schafer succeeds H. A. Perrin who has accepted the superintendency at Joliet.

—Miss Agnes Winn of Seattle, Wash., has been appointed assistant secretary of the National Education Association, with headquarters in Washington, D. C.

—Dr. John W. Carr of the Kentucky State Education Department has been appointed

President of the new State Normal School at Murray.

—The resignation of Prof. Carroll G. Pearce as president of the Milwaukee Normal School was submitted on December 1st to Charles S. Van Auker, president of the Wisconsin Board of Normal Regents. The resignation became effective January first.

In presenting his resignation, Prof. Pearce gave as his reasons the failure of the board of regents to meet the needs of the Milwaukee School for additional buildings, and the proposal to eliminate from the curriculum the fine arts course and the college courses now given in the normal. Prof. Pearce also disagreed with the policy of the majority of the board in refusing to undertake certain lines of educational endeavor which he regarded as essential to the teachers of the Badger State.

—Mr. E. P. Chapman has accepted the superintendency of the schools at Strasburg, Ill. Mr. Chapman succeeds Prof. Harney who resigned.

—Miss May E. Francis, on January 2nd, will take over the office of state superintendent of schools of Iowa, which has been held by Mr. P. E. McClenahan. A controversy has been in progress over the status of the office, inasmuch as the incumbent holds his term expires in July, 1923, and the executive council has ordered that Miss Francis take office on January 2nd. Miss Francis will be given a certificate of election for a term extending from January, 1923, to January, 1927.

—Mrs. Grace Stanley, of San Bernardino County, California, has been appointed superintendent of elementary education for the state, succeeding Dr. Margaret McNaught who retires on February first. Mrs. Stanley is a graduate of Stanford University and recently has been a member of the faculty of Chaffey Union Junior College at Ontario, Canada.

—The trustees of Teachers College, Columbia University, New York, have appointed Dr. Stephen S. Colvin, of Brown University, as Professor of Education. Prof. Colvin has a nationwide reputation for his studies in psychology as applied in the field of the measurement of intelligence. He is a graduate of Brown University and has studied in various universities both in this country and abroad. He has held pro-

fessorships in Brown University and in the University of Illinois.

Announcement has also been made of the appointment of Dr. Albert Shiels to a professorship in education. Dr. Shiels is a graduate of the College of the City of New York. He was at one time district superintendent of schools of New York City and later director of the division of reference and research. He filled the office of superintendent of schools at Los Angeles from 1916 to 1919 and since that time has been identified with movements affecting the immigrant and foreign population. Dr. Shiels' appointment is for service on the Schiff foundation, which has been endowed by Mr. F. M. Warburg in memory of Jacob N. Schiff.

—Dr. Robt. M. Bolenius, secretary of the board of education of Lancaster, Pa., since 1906, died on November 13th. Dr. Bolenius was a member of the board since 1885 and had served the schools for a period of 37 years.

—Mr. William A. Loeser, president of the board of education at Greenport, N. Y., for the past two years, died at his home in that city on November 17. Mr. Loeser had served three terms of three years each on the board. Mr. A. W. Young was elected to fill the office of president and Mr. G. E. Sterling to fill the vacancy on the board.

—Mr. David Whitworth, of Paoli, secretary of the school board at Tredyffrin, Pa., has presented his resignation to the president of that body. The resignation was presented in the interests of harmony and efficient operation of the schools.

—Dr. H. C. Hughes of DuBois, Pa., has been unanimously reelected as president of the school board for the third successive year.

—Mr. C. B. J. Snyder, superintendent of school buildings for the New York City board of education, at present on leave of absence, has decided not to return to the service after January first. Mr. Snyder has applied for a pension and has announced his retirement with the beginning of the new year. Mr. Snyder had originally intended to retire, but at the urgent request of President Ryan and Supt. Ettinger he was induced to reconsider his action and to take an extended leave of absence.

The



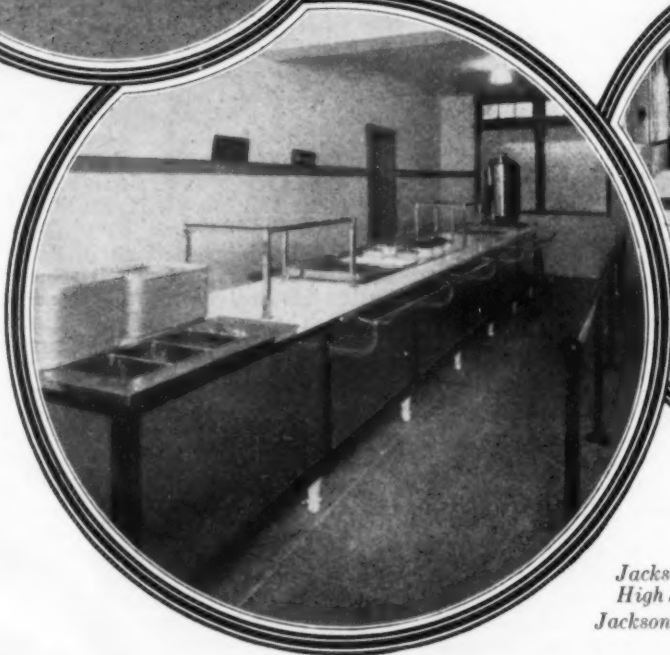
*Sheboygan High School
Sheboygan, Wis.*



*Muskegon Heights High School
Muskegon Heights, Mich.*



*Shaw Technical High School
Cleveland, Ohio.*



*Jacksonville
High School
Jacksonville, Ill.*



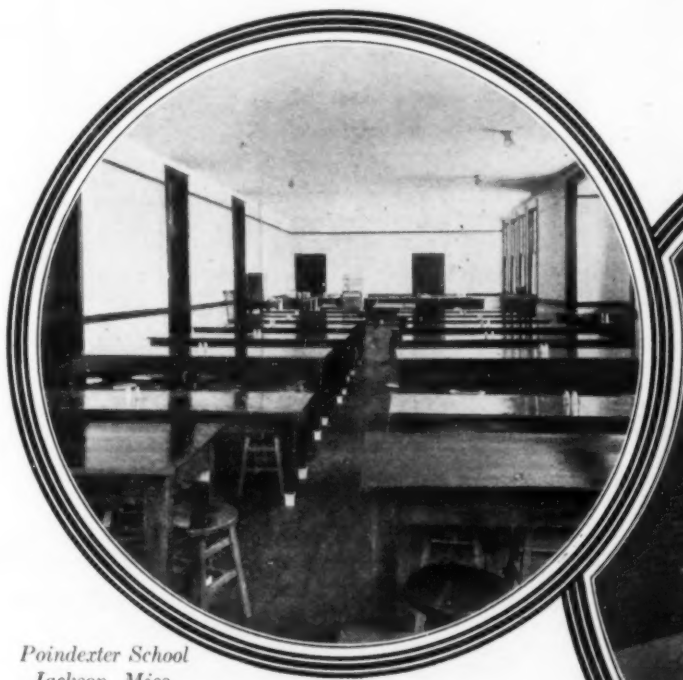
*Madison Vocational School
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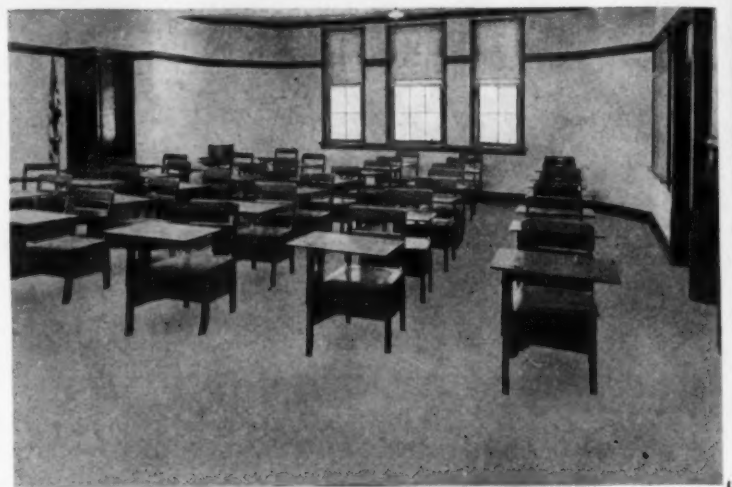
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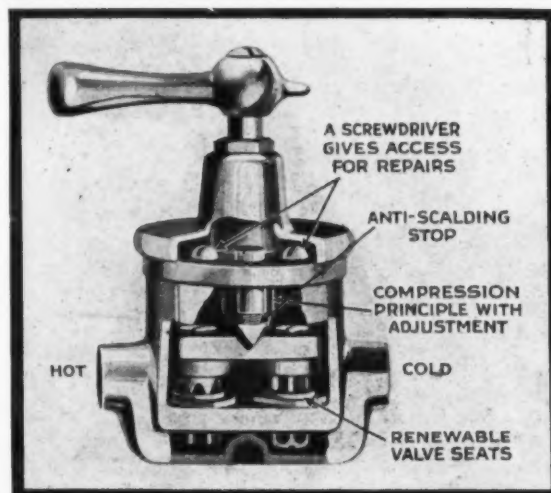
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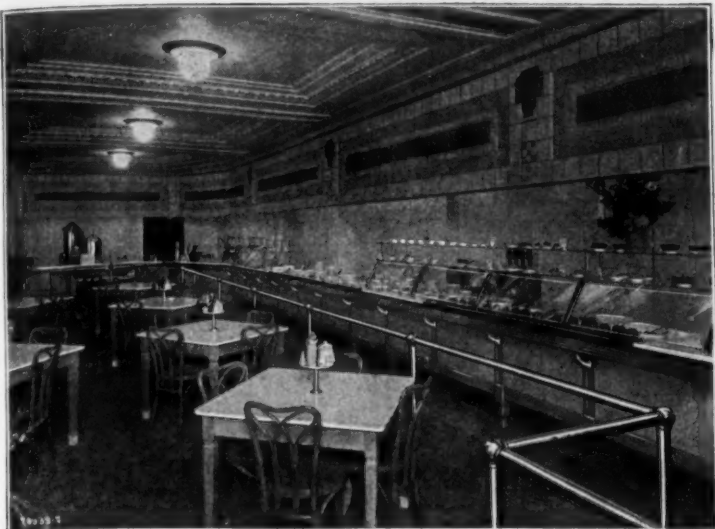
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SCHOOL BOARD NEWS

School Bonds Carry in Election by Six to One Vote.

With a double building program of rehabilitation and expansion of the San Francisco schools outlined, initial steps toward the construction of the new buildings and the acquisition of additional school lands with the \$12,000,000 made available for such purposes at the election in San Francisco November 21 will be taken at a conference at which will be present Mayor Rolph, Fred Dohrmann, Jr., president of the board of education; T. A. Reardon, president of the board of public works; City Architect John Reid, Jr., Supervisor Ralph McLeran, chairman of the finance committee of the board of supervisors.

As outlined by the board of education, the building program contemplates the construction of thirty new schools in all parts of the city and the purchase of additional school playground space wherever necessary. The second feature of the program is one of expansion of the schools so as to meet the needs of the city as the population increases from year to year. At present sixty additional classrooms are needed yearly to accommodate the 2600 new pupils in the schools, President Dohrmann said.

"Our problem is not the problem of any one district in San Francisco but the problem of every school in the city today and twenty years from today," President Dohrmann declared. "A comprehensive survey will be begun immediately by the school department as a basis for a definite plan for beginning the work of rebuilding and expanding." President Dohrmann pointed out that it will be at least a year before construction of the first school under the bond issue is under way. He also called attention to the

fact that the bond issue would not eliminate the need for the special school tax each year to provide funds for the normal expansion purposes.

The \$12,000,000 school bonds will bear the date of March 1, 1923, and will be sold from time to time as the money is needed for school construction. Redemption of the bonds begins in five years.

AMONG BOARDS OF EDUCATION.

The annual county board convention held at Stevens Point, Wis., in November was attended by five hundred persons.

Christopher W. Johnson who served as a member of the St. Louis, Mo., school board for a period of 25 years resigned owing to a lack of progress made by the schools. He says: "Reasons for this obstruction of progress can be found in the lack of co-operation among members of the board for the best interests of the public schools and in the absence of foresight and vision so necessary in an organization charged with the responsibility of the future development of an educational system that should predominate."

—Okmulgee, Okla. An opportunity high school has been in operation in the central part of the city for two years past. Every child over 12 years of age, who has not finished the sixth grade, is sent to this school. He is placed under special teachers and an effort is made to provide the work for which he seems best fitted. The plan is of advantage to the pupils of the opportunity school because it enables them to take work in which they are weak and to proceed with other courses of a more advanced grade. It is also of advantage to the normal classes since it enables the pupils to proceed at a faster rate of speed.

—Sault Ste. Marie, Mich. The board of education has adopted an accounting system recommended by the U. S. Bureau of Education. The school budget for the year amounts to \$243,995. Of this amount, \$180,100 is to be raised by special tax.

—Oil City, Pa. Retardation of pupils in the schools costs the city about \$75,000, according to a report of Supt. Leroy Weller made to the board of education. Apparently there is no single cause for the condition as there is no case

of subnormality in the school system. It will be the chief duty of the superintendent this year to seek out the reasons for retardation and to apply the remedy both for financial and educational reasons.

—Wilmington, Del. The platoon system has been introduced in one of the schools to relieve some of the faults of the educational program. The plan was adopted following an exhaustive survey which sought the elimination of the part-time evil and a more general use of the building. The plan will later be extended to other schools.

—The 1922 law relating to the election of school trustees in Kentucky repeals the 1920 law and school commissioners now in the office hold over until the provisions of the 1922 law become operative in 1923, according to the Kentucky Court of Appeals. The court overruled a motion to dissolve the temporary injunction granted Nick Reid in the Bath Circuit Court enjoining the county clerk from placing the names of candidates on the ballot. The court held that the clerk had no authority to place the names of candidates on the ballot and that the Circuit judge of Bath County did right in issuing the restraining order.

—Elgin, Ill. The board of education in view of the provisions of a state law on fraternities, has ordered a thorough investigation among students of the high school. The action is interpreted as a warning to high school students who are suspected of belonging to Greek letter organizations and secret societies. Organization of secret societies under the guise of school clubs are termed "evasions" by the president of the board.

—The right of student fraternities to exist in the high schools of Missouri has been sustained by the Supreme Court in a decision enjoining the St. Louis board from debarring fraternity members from student activities and graduation exercises. The decision reverses an opinion of the Circuit Court which denied an injunction and held the board was within its power in adopting a discriminatory rule against members of the fraternities.

In the decision, the court held that the right of children to attend the schools cannot be restricted as in the anti-fraternity rule, without unjust

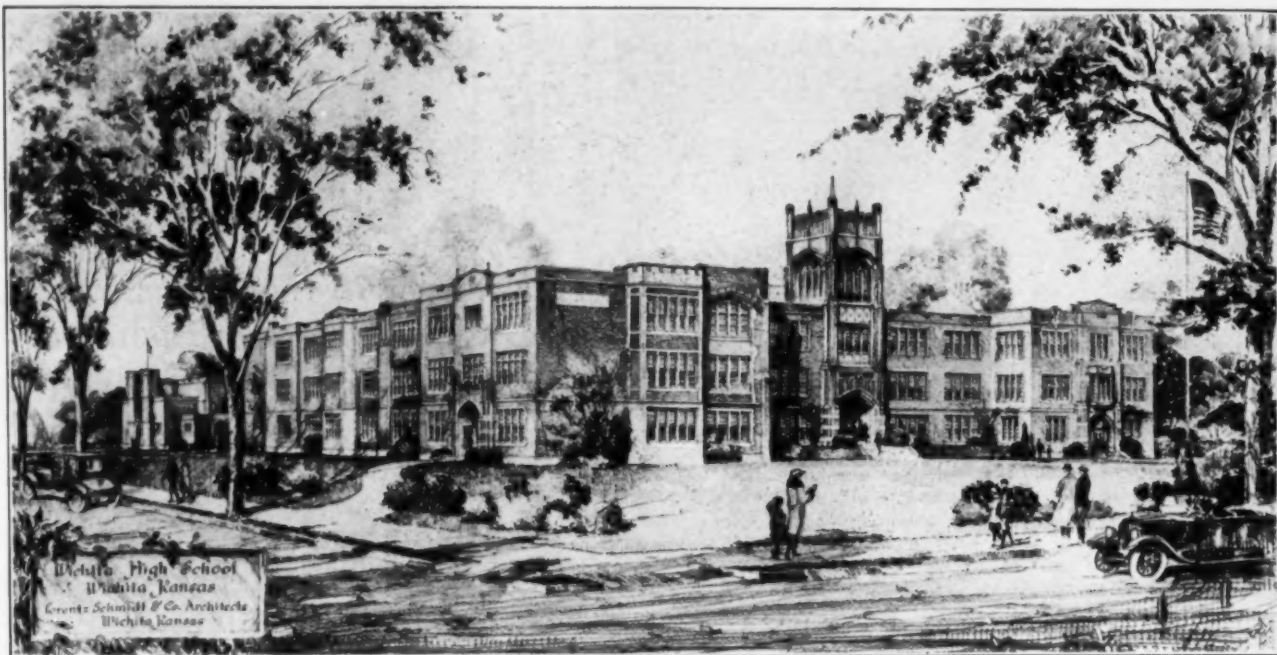
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The laboratory drain lines
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Let us send our
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DURIRON
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DRAIN PIPE



The drain lines carrying acid wastes from the school laboratory must resist the corroding effect of these wastes or there will be continual repairs and damage.

Duriron drain pipe, besides being entirely resistant to all acids, answers every plumbing requirement for the sanitary waste line as well, and so one line may be used both for the acid and the sanitary waste.

No other acid resisting pipe will fulfill these dual requirements.

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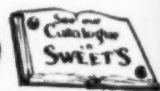
Save repairs.

Save the structure.

Save money.



The Duriron Company, Dayton Ohio



discrimination. No rule should be adopted, the court said, which attempts to control the conduct of pupils out of school hours, after they have reached their homes.

—Houston, Tex. Through a recent decision of the Supreme Court, 28 square miles of territory outside the city limits has been added to the independent district of Houston. The action was taken in the suit of certain taxpayers in former district No. 25 against the city council, filed after the council had attempted, by ordinance to divorce the schools of the district from the city schools.

It appears that since 1910 the city had been taking into its limits portions of the former district 25, which borders on the city on the north. In these annexations no bond or other fiscal adjustments had been made with the district and the board of trustees had finally asked for a settlement. As a result, the city administration took the district into the Houston independent school district.

This year certain bond attorneys questioned whether school bonds to be issued would be valid, since the district was not in the city but in the Houston School District. The city council thereupon passed an ordinance casting out the foster child. The taxpayers followed with an injunction suit. The Galveston court of civil appeals upheld the legality of the consolidation and the city applied to the Supreme Court on a writ of error, which was denied. It is now believed that the objection of bond attorneys will be removed by the action of the Supreme court in affirming that the district is legally a part of the Houston district, although not in the city proper.

—New Orleans, La. Rules governing corporal punishment have been given out recently by Supt. G. M. Gwinn. The rules provide that no corporal punishment may be given to a student in the high school. In grade schools, only boys may be so disciplined, but only in the presence of the principal. The rules for administering punishment are very strict and provide that only a ruler or similar object may be used. Supt. Gwinn holds that the need for corporal punishment arises very seldom in the schools.

—Columbus, O. The board of education is without legal authority to purchase or sell school supplies other than textbooks, to pupils

at a profit of ten per cent, according to a decision of Attorney General Price. In the same opinion, it was held that the board may legally buy textbooks with school funds and turn them over to school principals or members of student councils to be sold, the profit to be retained by those selling the books. A contract for the sale of books may be made with any responsible persons.

—Memphis, Tenn. Radical changes in the education laws of the city and state at large are proposed to enable the city schools to keep up with the march of progress. These include an increase of two members on the board of education making a total of seven; a mandatory tax of 65 cents for school purposes with the resultant fund to be independent of other municipal purposes; authorization of the city school board to construct parental schools for incorrigibly truant children, and the granting to cities of more than 10,000 school population, authority to compel children between 17 and 21 years of age to take part time education.

—Williamsport, Pa. The teachers of Lycoming County, at a recent conference, undertook a study of the new state course in geography which has been worked out by a committee appointed by the state education department. The new course emphasizes a sequence of geography through the grades from the first to the eighth grade, and trains the child in obtaining original sources of information. The course eliminates the large quantity of dry, meaningless facts concerning boundaries and numerous other things and gives the child a better conception of information of real value to him in later years.

—The school board of Newburyport, Mass., has registered its opposition to the proposal to raise the compulsory school age from 15 to 17 years, which would also raise the continuation age to 16 years. The board has instructed the senator and representative to inform the state legislature that such action is not desirable at the present time.

—The associated school committee of the civic leagues of Flatbush, N. Y., recommends a paid school board. Its contention is that, while the present school board is made up of public spirited and well intentioned citizens, the task assigned to them is too large to do it full jus-

tice. It recommends that men be employed who can give all their time to the work.

—The New York City board of education owns a warehouse full of old style square pianos which it has been unable to sell. Besides, under the law, the board cannot destroy them. Legal advice on how to get rid of them will be sought.

—A dinner was recently tendered in honor of George J. Ryan, president of the board of education of New York City. Mayor Hylan praised Mr. Ryan for the drastic manner in which he was speeding schoolhouse construction.

—The Hackensack, N. J., school board approved a student traffic cop system whereby the boys patrol the street crossings near school buildings before and after school hours.

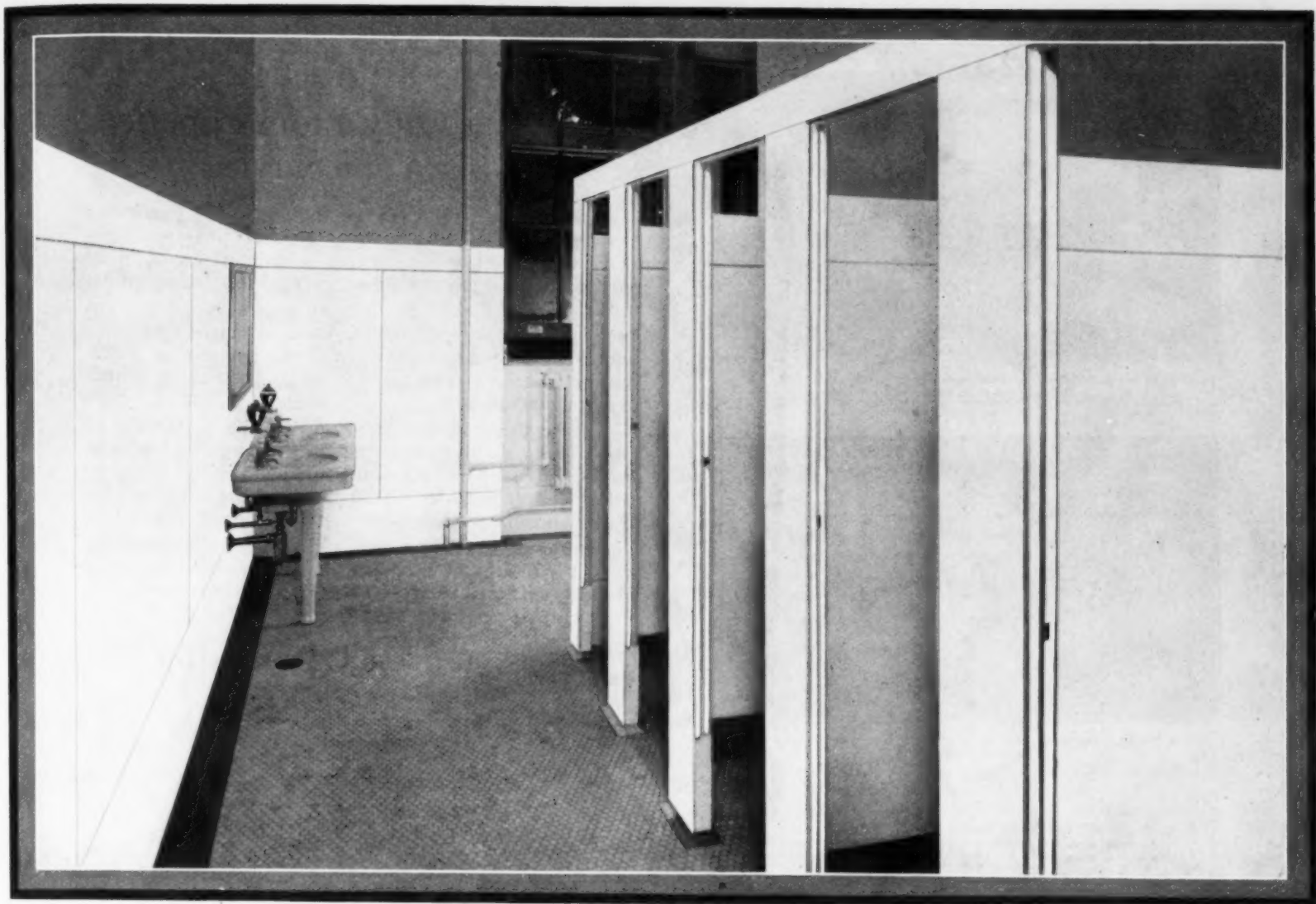
—Arthur S. Somers, member of the New York City board of education is also the president of the Brooklyn Chamber of Commerce, thus bringing the business men of that city into sympathetic touch with Greater New York's gigantic school problem.

—Suit was recently brought in the Circuit Court at Newport, Ky., to enjoin the members of the Campbell County Board of Health from enforcing compulsory vaccination for school children. It appears that a pupil 8 years of age, had been refused admission to school because she had not been vaccinated. The county board of health had endorsed the enforcement of the vaccination law by the local authorities.

—Akron, O. School children have been given free dental service. The board has an appropriation of \$5,000 for the first year's work, which has been placed in charge of a dentist and nurse.

—Bloomington, Ill. The board of education has refused to permit the city health commissioner to make physical examinations of the school children. The refusal is based on the ground that there is no epidemic and that such examinations would trespass upon the rights of the children.

—The Supreme Court of California has decided that the King James Version of the Bible is sectarian in character. The decision reverses a ruling of the Superior Court permitting the purchase of two copies of the Bible for the school library. The court held that the acquisition of the Bibles by the school would be in direct violation of the school law.



How Vitrolite Solves the Problem of Vandalism in Schools

The new Cobb-Cook School, Hibbing, Minn., is recognized as among the finest and most modern in the United States.

Wainscoting and toilet partitions are Vitrolite, of course.

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Better than marble, harder than flint, *stainproof*, acid resisting and sanitary. Cleans easily with a damp cloth. Restful to eyes and nerves, changeless, *always looks new and spotless*—and first cost is last cost.

Complete information and working data on request.

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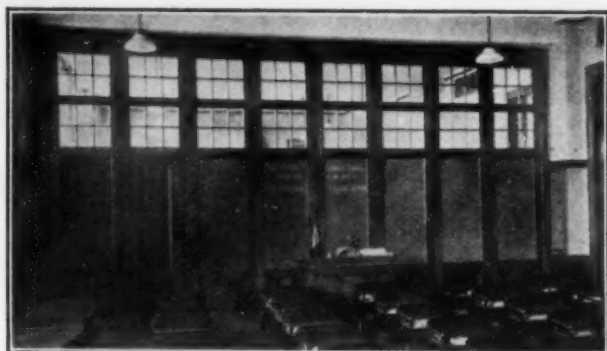
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For general assembly or meetings, many rooms into one.
Doors drawn to the side.



For study, one room into many. Note blackboards and
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To those of you who realize that movable partitions are essential in every School, this is of interest. No two school buildings are alike. Seldom are two folding partitions built exactly alike. Sizes differ. Conditions differ.

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To insure the ease of operation and the perfection of finish to which you are entitled, every part of Section-Fold Partitions is made in our own shops. Every order is made to order. That is one of the reasons why Wilson products have been standard for 47 years.

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THE TEACHER'S WAGE AND LIVING COSTS.

At Boulder, Colorado, the teacher's wage has been subjected to an analysis as to its purchasing power. This analysis is based on the retail price of 22 commodities and covers a period of fifteen years. The figures have been tabulated as follows:

Year	Average Monthly Salary	Index Number, 22 Articles	Purchasing Power of Salary	Gain Per Cent	Loss Per Cent
1907	\$ 68.75	82	83.8	5.27	00.00
1908	71.25	84	84.8	6.33	00.00
1909	73.47	89	82.5	4.15	00.00
1910	76.12	93	81.8	3.50	00.00
1911	77.00	92	84.3	6.38	00.00
1912	78.67	98	80.2	1.74	00.00
1913	78.88	100	78.8	0.00	00.00
1914	85.00	102	83.3	5.70	00.00
1915	85.00	101	84.1	6.42	00.00
1916	85.55	114	75.0	0.00	6.21
1917	85.70	146	58.7	0.00	38.45
1918	93.43	168	55.6	0.00	52.52
1919	106.09	186	57.0	0.00	60.55
1920	112.10	203	55.1	0.00	73.38
1921	141.42	156	90.6	23.40	00.00

Total per cent loss or gain.....63.05 231.11
63.05

Net total percentage of loss..... 168.08
156 = Eight months, January to August.

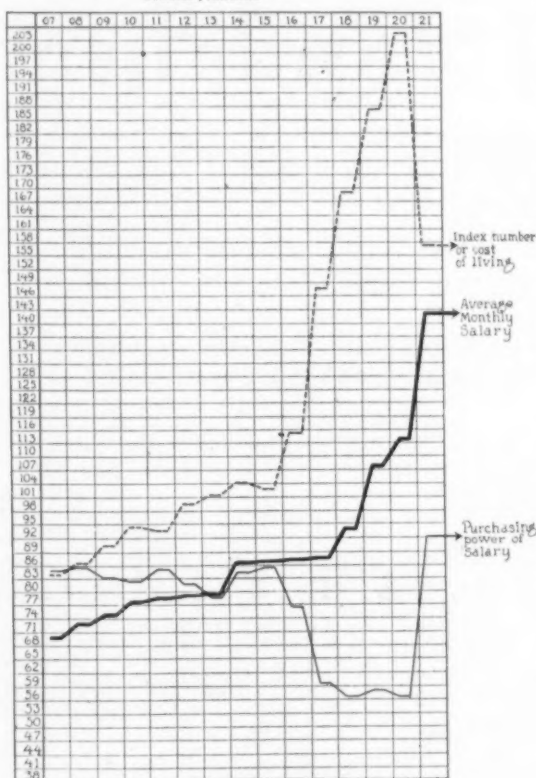
In presenting this statement Superintendent W. V. Casey says: "The conclusion is that teachers have already taken their losses, and are not nearly even with the world to-day. To talk a reduction of wages in the face of these facts is to ignore fairness and justice."

TEACHERS' SALARIES.

—Paterson, N. J. Increases of \$100 or \$200 based on the several groups of teachers, have been given to 550 instructors. Under the new schedule, elementary teachers receiving less than \$1,900 receive \$100 more than their salary previous to September first. Those receiving \$1,900 receive \$200 more. In the case of the high school teachers, the regular increase of \$200 is given, and the same amount is given all other teachers on their anniversaries. No high school teachers will receive more than \$3,000 without meeting the special requirements adopted by the board.

—Illinois teachers' salaries are 32 per cent more than the cost of living, according to R. C. Moore, secretary of the state teachers' association. As compared with figures on the cost of

GRAPH SHOWING VARIATION BETWEEN TEACHERS' WAGES, THE COST OF LIVING, AND THE PURCHASING POWER OF GRADE TEACHERS' WAGES FROM 1907 TO 1921 INCLUSIVE—BOULDER, COLORADO



living published by the United States Department of Labor, teachers' salaries have increased 94 per cent in eight years.

Taking the cost of living at 100 in 1913, Mr. Moore's tables show that this cost had risen to 147 in 1921, and the average of salaries for teachers had risen to 194, the former showing a 47 per cent increase, while the latter showed a 94 per cent increase. The average of all teachers' annual salaries in the state in 1921 was \$1,286.

In 1913 teachers had 100 cents to purchase every 100 cents' worth of the cost of living. Now they have 194 cents for every 147 cents' worth of the cost of living. Therefore, teachers are paid 32 per cent more than the cost of living, and their financial condition has improved 32 per cent.

—West Frankfort, Ill. Ninety-one teachers in grade schools of Consolidated School District No. 68, embracing city and rural schools in Deming and Frankfort townships, walked out recently, following the defeat of a \$68,000 bond election. The bond issue was for the purpose of paying outstanding orders of last year for school expenses and teachers' salaries, after the local banks had refused to handle more orders. Approximately 3,800 children in the schools returned to their homes with their books for an undetermined vacation.

PERSONAL NEWS OF SUPERINTENDENTS.

—Mr. Grant Finch, since 1909 superintendent of schools at Dillon, Mont., and director of training in the Montana Normal College, has been given a year's leave of absence on half pay. Mr. Finch is spending his leave of absence at Columbia University where he has entered upon a special advanced course in educational methods.

—The new school built by the town of Friendship, Me., was recently dedicated by Superintendent R. J. Condon, Cincinnati, O., who was born in Friendship. The speakers of the occasion besides Mr. Condon were: F. L. S. Morse, superintendent of Friendship; A. J. Roberts, president of Colby College, and Augustus O. Thomas, state superintendent of schools.

—The Maxwell Memorial Fund of New York has now collected \$13,792.98. Superintendent Ettinger is urging the teachers to complete the fund in order that the memorial may be completed.

—Mr. H. W. Anderson of Detroit, Mich., has been appointed assistant superintendent of schools at Denver, Colo. In addition to acting as assistant superintendent under Mr. J. A. Newlon, Mr. Anderson will have charge of the department of classification and statistics, succeeding George W. Frasier.

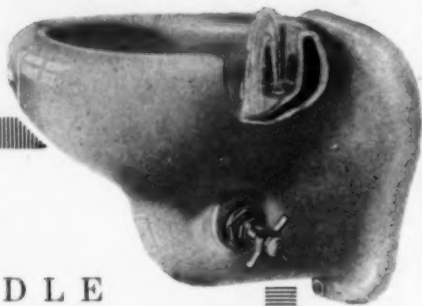


Still another service derived from The Johnson Pneumatic System of Temperature Regulation is that the apparatus and their principles are beyond any and all stages of experiment. When a customer receives Johnson Service equipment and installation, there remains no cause for even a question as to application and results. And with the vital essential of temperature control being performance after installation, and not promises before, this Johnson feature of service is a priceless safety measure as well as surety: importantly worth more than passing notice.

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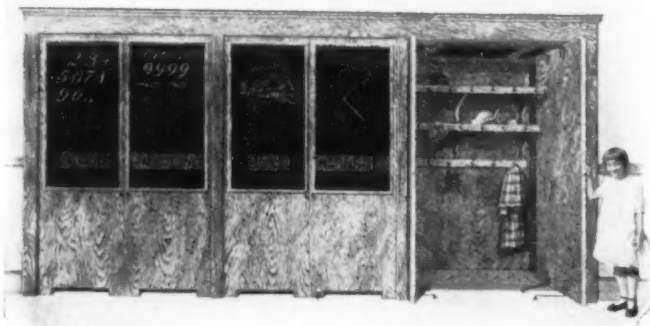
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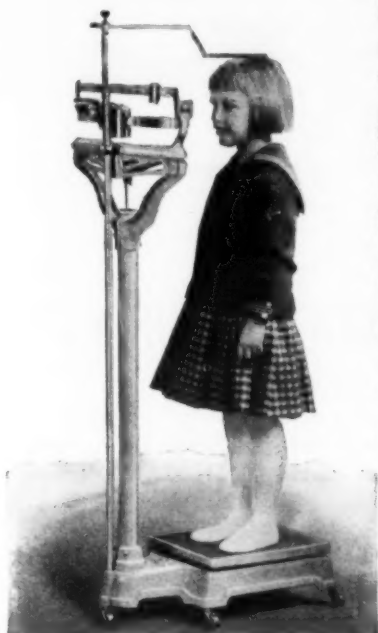
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FOR BUSY SUPERINTENDENTS

—The Department of Superintendence of the Kentucky Educational Association held its annual meeting on December 15 and 16, at Frankfort. State Supt. George Colvin made the opening address of the meeting and there were talks by such well known educators as Dr. B. H. Bode, Ohio State University; Dr. R. Ames Montgomery, president of Center College, Kentucky; Supt. Z. E. Scott, Louisville; Wellington Patrick, director of extension work for the University of Kentucky; J. B. Holloway and J. W. Carr, state high school inspectors, and McHenry Rhoads, chairman of the committee on accredited schools of the state.

—New Haven, Conn. Three short vacation terms of five days each have been substituted for the long Easter vacation of eleven days. The board has ordered that the first vacation be from February 22 to 26, the second from March 30 to April 3, and the third from May 30 to June 3. New Years and Lincoln's Birthday are not included in these groups.

—West Frankfort, Ill. The elementary schools of the district which have been closed since September for lack of funds to pay teachers, will remain closed the remainder of the year, as a result of the failure of citizens to reach an understanding. Thirty-five hundred children are affected by the enforced closing. The district through its action loses \$19,000 of state funds given when schools are maintained for full seven months.

—The school board of Freeport, Ill., is faced with the problem of vandalism on the part of certain malicious individuals. On Halloween a number of the traffic signs near the schools were broken and since then they have been pelted with stones, causing breakage and rust.

To stop the destruction, the board has offered a reward of \$5 for information leading to the arrest and conviction of any person damaging these signs.

—Yakima, Wash. School children taking the mentality tests grade considerably higher than the average for other cities, according to Supt. A. C. Davis. At the beginning of the school year, 368 children who were about to enter school for the first year were given the mentality test known as the Detroit primary test. Of these children, 103 were classified as superior, 206 as average and 59 as slow-moving. In other schools the average per cent of children taking the test classified as superior is 20 per cent; in Yakima it is 27.90 per cent; the average children in other towns represents 60 per cent of all those taking the tests; in Yakima the percentage is 55.98. Children classified as slow-moving average the same as the number of superior in almost every place the test has been given—20 per cent of the group. In Yakima the number is considerably less, being 16.03 per cent.

Group tests are also given in the intermediate and upper grades, and where these are not satisfactory, the Terman individual test is given. There are many advantages to the test. Several unusually bright children have been found who could be advanced more rapidly and many of the children in the superior group were capable of completing a year's work in a semester. Children of the slow-moving group are given the work as rapidly as they are ready for it.

—The state of California now has more than 1100 parent-teacher associations, with an individual membership of over 53,000 parents and teachers. The associations have been termed little democracies devoted to the advancement of the interests of boys and girls.

—Mr. E. C. Witham of Wilmington, Del., is the author of Witham's standard tests in arithmetic, published by the J. L. Hammett Co., at Cambridge, Mass. The sheets show the tests for addition, subtraction, multiplication, division, fractions, decimals, percentage and denominate numbers, also a sheet combining all the essentials of several tests in one test. The sheets give the method for scoring, typical problems to be solved and the manner of obtaining

the standard score.

—Upper Darby, Pa. Each year since 1917 the last week in October has been observed in the schools as Visitors' Week. Notices are sent into all the homes, urging parents and friends to visit the schools some time during the week. The response has been most gratifying. More than eight hundred visitors came to the schools during the five visiting days this year.

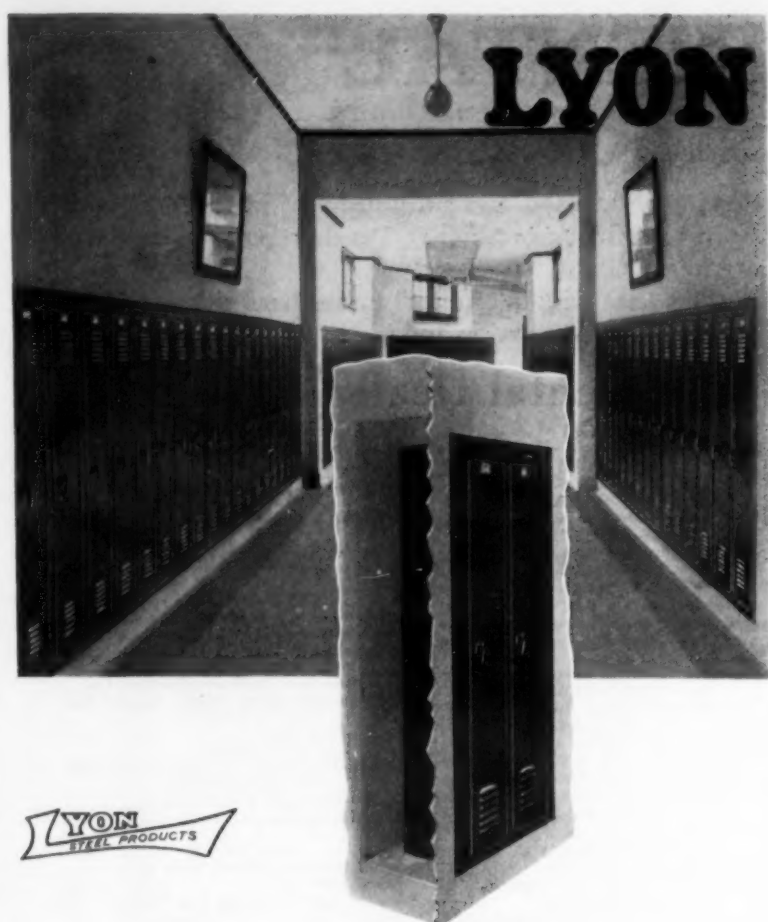
—Morgantown, W. Va. Three teachers are employed to work with exceptionally bright and slow pupils of the schools. They give intelligence and educational tests, assist in grading and re-grading pupils and recommend children for the special room for older pupils. This room is ungraded and pupils are given the kind of work for which they are best fitted. Although not every pupil was promoted each term last year, the equivalent of one hundred per cent promotions was made. Before the work with the exceptional children was begun, it was not possible to promote more than 94 per cent of the pupils.

—Rockford, Ill. Pupils of five southeast end schools in December received \$8,141 from the thrift bank funds deposited by the pupils in their school banks since January, 1922. When the money is distributed, much of it is converted by the pupils into regular savings accounts in the local bank. The bank furnishes the supplies and acts as depository for the school banks. Each school has its student cashiers and tellers to run the system. There is considerable rivalry among the schools to secure the largest number of depositors in proportion to the enrollment.

—A total of 889,923 students was enrolled in California state schools during 1921, according to estimates compiled in the state department of education. The figures include the enrollment in elementary, secondary and kindergarten schools, junior and teachers' colleges, special schools and the State University. The enrollment was divided as follows:

Elementary, 570,779; kindergarten, 46,131; high schools, 227,190; junior colleges, 2,769; special schools, 580.

—Los Angeles, Calif. Examinations of sub-normal children who may be benefited by a term in the new State School for Morons, will be made



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in the near future by a representative of the Psychopathic Society. At the school no charges are made for instruction. The children are selected by the society and are taught rug-weaving, toy making and similar manual crafts.

—Shamokin, Pa. The drought situation in the city has become so acute that milk has in some cases been resorted to as a substitute for water. Several schools in suburban sections have discontinued because of the failure of the water supply.

—The educational advancement program of extension activities for the public schools of Philadelphia, which was adopted recently, will cost \$112,620. The program which was adopted for the year 1923 includes higher salaries for night school teachers; additional summer schools; Americanization classes; payment of expenses of delegates to the conventions of the several groups; additional nurses and attendance employees, and teachers for children with speech defects. One of the most costly items is the creation of auxiliary teachers in elementary schools. These teachers will do special work in the divisions of industrial arts, home economics, and special education.

The special committee which is composed of the chairmen of the standing committees, has been at work for several months, with Supt. E. C. Broome, in the preparation of the program which is well within the financial means of the board. The items which have been provided for in the budget but for which money must be found are: Auxiliary teachers in elementary schools; provision for salary adjustment in continuation schools; teachers for correcting defective speech, and increases in supervisors' salaries.

The scarcity of coal in South Jersey has brought the schools, churches and public buildings face to face with enforced closing. The principal reasons for the coal situation are the lack of cars for shipment and the high wages being paid mine workers. Miners who formerly worked ten hours for \$5 or \$6 are now working six hours for \$10 to \$18.

—Berea, O. Students in Junior high school classes have been grouped according to results obtained in intelligence tests. A testing program using three series of educational tests

has been worked out for the year.

—Monrovia, Calif. Additional physical training quarters and equipment have been provided for both boys and girls. The showers, dressing rooms and equipment have been practically doubled.

—State Supt. John Callahan of Wisconsin has come out boldly in favor of the consolidation of rural schools as a means of providing better educational facilities for rural children and of giving the teachers a fair chance to do their best work. Supt. Callahan has committed himself to the task of obtaining funds to carry out a definite program of reconstruction in rural school training and to this end has prepared a program which will be presented to the next legislature for approval. The plan of organization which is sane, practical in operation and all-inclusive in its provisions for adequate supervision, embraces the following recommendations:

First—An elective county board of three or five members charged with general supervision of all the schools of the county outside of cities having a city superintendent.

Second—The placing of the powers of the board in a board as a unit, these powers to be exercised only after collective action by the board.

Third—The board to select an expert educational officer, commonly known as the county superintendent, to be the educational adviser and executive officer.

Fourth—The county board is to have the following powers: Appointment of a county superintendent and the fixing of the salary; appointment upon the nomination of the county superintendent of a stenographic clerk for the superintendent; appointment upon the nomination of the county superintendent of the supervising teachers; recommendations to district boards of teachers and principals; putting into effect the state course of study; exercising the powers now conferred upon town boards, village trustees, and common councils relating to the formation, alteration, or consolidation of school districts; general supervision of provisions with reference to transportation; closing of all schools whose average daily attendance the preceding year was less than ten pupils; providing

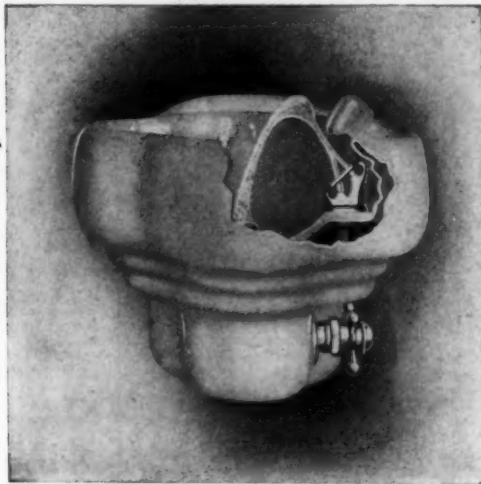
for an annual audit of all the business and financial transactions and accounts of the county treasurer as they relate to school purposes; conducting the schools on a budget basis; providing more adequately for rural high schools.

The state board of education has also given much thought to school consolidation. From its program is taken the following principles as indicative of the board's belief in consolidation and its efforts toward bringing about this important administrative procedure:

In order to bring to the small school the highest professional service and the best educational equipment, it is essential that there be consolidation of small schools. The educational arguments for consolidation, conclusive as they are, apparently have failed to persuade large numbers of people to give up the small isolated school. Local ties and convenience of access, particularly for the younger children have, together with some mistakes in administration, combined to prevent any rapid movement toward the consolidation of schools, though fairly steady progress is being made.

Efforts should be continued to bring about the consolidation of schools. Where for sentimental or for practical reasons it is not possible to effect consolidation, some better organization of the educational facilities should be brought about. The burden of carrying eight grades for a very mixed group of children will be greatly simplified if the one room rural school is confined to the first six grades of the elementary school, in areas where consolidation as we are now seeking to effect it is not feasible, but where the organization of either junior high school districts or general high school districts is feasible.

—Philadelphia, Pa. The members of the property committee of the board of education have recently expressed concern over the increasing cost of buildings and repairs. This was especially noted in connection with the opening of bids for the new Junior High school at East Washington Lane and Musgrave Street. The lowest bid amounted to \$961,547. The estimates exceed by \$138,000 the cost of the new Roxborough plant, modeled on the same plan. Buildings of similar design were erected shortly after the armistice for \$500,000.



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Assuming that the stream should be projected from the side, automatic stream control is vitally important.

Without automatic control to care for varying line pressures, a heavy pressure tends to throw the water out on the floor. A light pressure causes the drinking stream to be lower than it should be and the mouth is placed too near the water outlet for sanitation.

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Halsey Taylor Automatic Stream Controlled Drinking Fountains maintain a uniform height of stream at all times even with line pressure variation up to fifty pounds.

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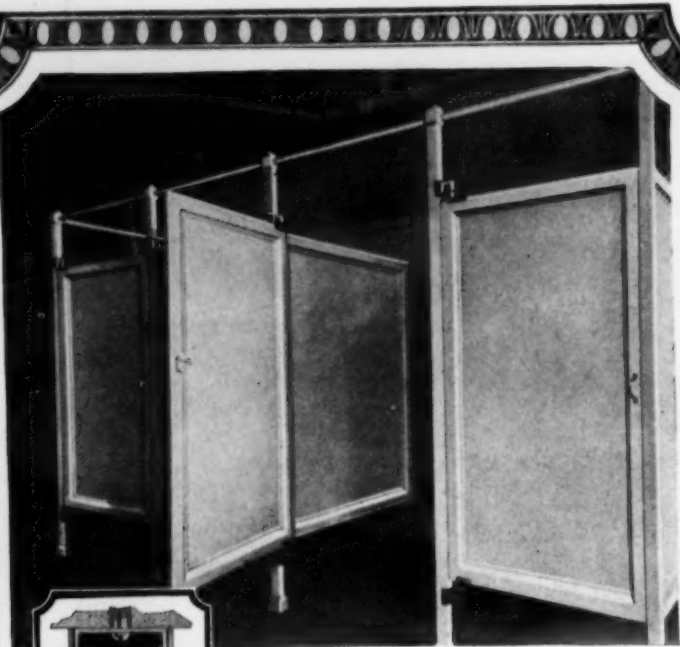


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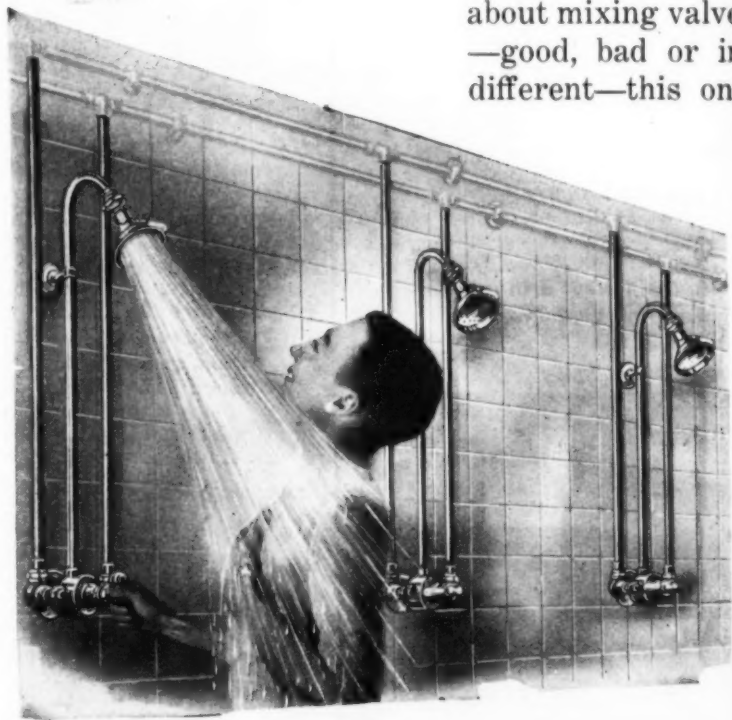
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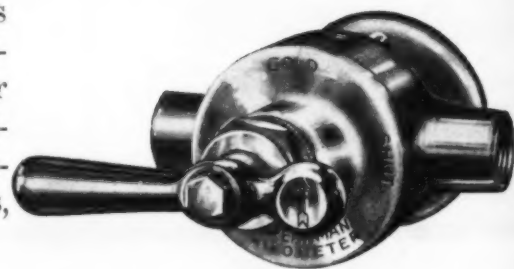
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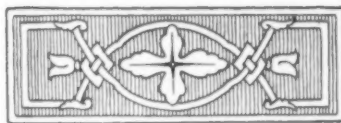
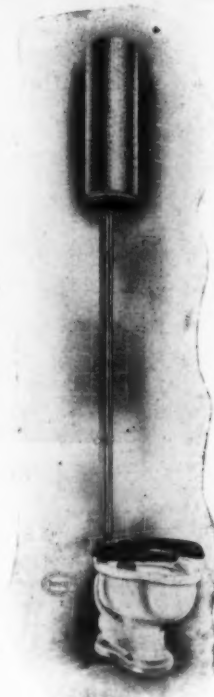
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NUTRITION AND EDUCATION.

An interesting study dealing with under-age children in the schools was recently completed by Dr. E. Blanche Sterling, acting assistant surgeon of the United States Public Health Service.

The purpose of the study is stated in the following paragraph: Two insistent questions arise in the minds of thoughtful parents everywhere: Shall I send my child to school as soon as the law says he is old enough to go, or would it be better for his health if I kept him out till he is older? If he seems brighter than the average child, will it be detrimental to his health to permit him to be "accelerated"—to make as rapid progress through the school grades as his teachers desire?

The answers to these questions have usually been colored by personal viewpoints and therefore have been contradictory and confusing. Hence the study which was made in a typical small mid-west city covered 2068 children.

Of these 487, or 23.5 per cent were found to be under weight, which included grade, junior and senior high school pupils. The percentage of underweight in the grades was 21.0 per cent, in junior high 23.8 per cent and in the senior high 29.8 per cent.

The test of the under-age for grade children, ninety in number, brought out the fact that forty-two of these who were underweight in the fall, but twenty-three, or 54.7 per cent, had come up to normal weight during the following spring. In the junior High school the 32.1 per cent of under-age pupils gained their normal weight during the period of the fall and spring test.

The study is concluded with the following summary:

"The work of the elementary grades apparently had little, if any, adverse effect on the pupils' weight. Of the children who entered the schools up to the standard of eight in the fall, remarkably few were under weight in March. This was entirely irrespective of the age of the pupil, the underage child making quite as good showing as the normal age or overage child.

"There was a slightly larger amount of underweight among the overage children in the ele-

mentary schools, as well as a slightly larger average number of physical defects per child.

"There was a large percentage of underweight among the underage children in the junior high school. Also there was a larger percentage of underweight among the bright children in the accelerated groups, both in the elementary and junior high schools, than among the other children.

"As in the elementary schools, there was shown to be only a small percentage of change from a good to a poor nutritional status in the junior high school, from October to March, among the children doing regular grade work.

"Acceleration in the elementary schools shows a larger percentage of change from good to poor nutritional status than does acceleration in the junior high school, or the regular grade work of either school. In the accelerated classes of the junior high school similar changes are less than among the accelerated pupils in the elementary schools, but greater than among the children doing regular grade work. It must be remembered, however, that a much larger number of accelerated children should be studied in order to arrive at results which might be considered as in any way definitely conclusive.

Detroit's School Superintendents.

A recent issue of the Detroit Educational Bulletin enumerates the men who have served that city as school superintendent since the establishment of the system. They are the following: 1856, J. F. Nichols; 1863-5, J. M. B. Sill; 1865-1873, Duane Doty; 1873, W. E. Robinson; 1897-1912, Wales C. Martindale; 1912-19, Charles E. Chadsey; 1919-, Frank Cody.

Michigan Educational Needs.

Thomas E. Johnson, state superintendent of Michigan summarizes the educational needs of his state as follows:

1. An adequate appropriation for the teacher training institutions.
2. Equalization of educational opportunities by means of an equalization of maintenance costs of the state. By that is meant a method of fully adjusting the tax rate for school maintenance so that it will be practically uniform throughout the state.
3. Legislation to guarantee adequate compensation, adequate help and adequate power

to the county commissioner's office.

4. Legislation to provide a recreation fund to take the place of that formerly supplied by the State Boxing Law.

The need for equalization of the educational tax burden to secure equality of opportunity for each child is obvious. At present some districts pay over \$30 per \$1,000 of assessed valuation and many pay more than \$20 for school tax. The average for the state is about \$7.70.

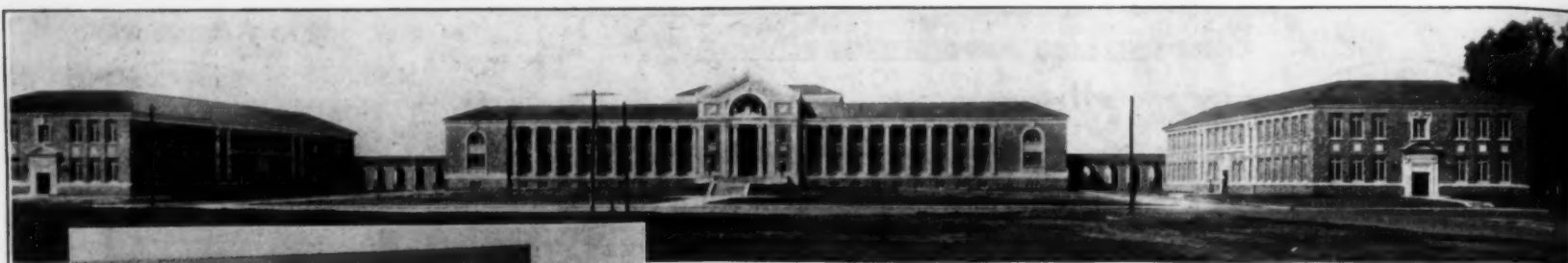
HYGIENE AND SANITATION.

—Lexington, Mass. A worth-while program in health supervision has been worked out in the schools. Dr. Wm. L. Barnes is school physician and Miss Rose M. McGinley is school nurse. The program provides for a rather complete physical examination of 1700 children each year by the physician and nurse. Follow-up work is carried out by the nurse who sees that steps are taken toward the remedying of defects revealed by the inspections. Health habits work in the elementary grades is supervised by the nurse, and height and weight measurements are made by the teachers. Special instructions in nutrition work are carried out for the benefit of children designated as underweight.

—A mental hygiene survey was made in North Dakota during the autumn months followed by recommendations to the governor and the legislators. The survey was conducted under the auspices of the National Committee for mental Hygiene by Dr. Thomas H. Haines, Consultant for the National Committee for Mental Hygiene; Director, Dr. Ward G. Reeder, Assistant Professor of School Administration, Ohio State University; Mr. C. L. Hultgren, Psychologist for the National Committee; and Mina A. Sessions and Lucille Martin, Psychiatric Social Workers for the Committee.

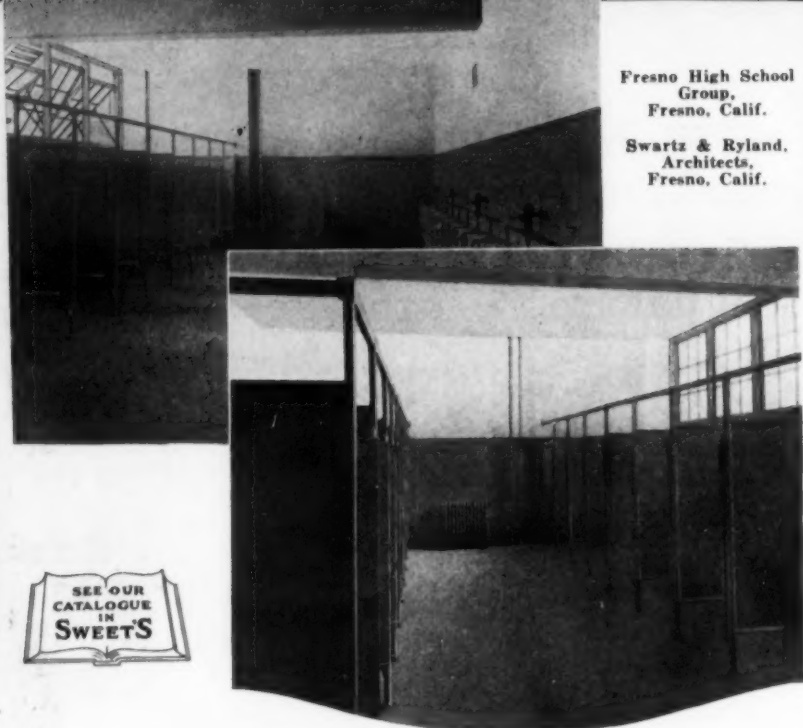
—Rice Lake, Wis. Milk lunches are served daily to about 300 scholars in the graded schools. More than three-fourths of the children pay for their own lunches. The board furnishes milk free to underweight pupils who are unable to pay for it.

A school nurse has been employed, scales have been installed in each building, and the children are weighed regularly. A free chest clinic is held under the auspices of the schools in September and in May of each school year.



Fresno High School
Group,
Fresno, Calif.

Swartz & Ryland,
Architects,
Fresno, Calif.



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COMPARTMENTS TOILET, SHOWER, DRESSING ROOM

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Sixteen gauge ($\frac{1}{8}$ inch), special smooth finish, Keystone Copper-bearing steel throughout (excepting door rails and stiles); brass foot castings on all posts; special "WEISTEEL" Universal Hinges; nickel plated hardware, including heavy slide bar latch. These are a few of the details which, coupled with standardized precision methods of manufacture, are causing progressive architects to specify "WEISTEEL" exclusively for all kinds of buildings.

Better than slate or marble, with a saving of 40 to 60%.

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HENRY WEIS MANUFACTURING COMPANY

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ATCHISON, KANSAS

—San Diego, Calif. Malnutrition among children has increasingly attracted the attention of physicians and teachers alert to the responsibility of promoting the health of pupils. The work of the P. T. A. organization of San Diego in furnishing milk to undernourished children during school sessions indicates a solution of the problem. All children who are seven per cent or more underweight are malnourished and are furnished with half a pint of milk each day by the P. T. A. organization. The society has also organized nutrition classes where conditions have been found especially serious. The service has been extended to ten schools, with 1,204 children receiving one-half pint of milk each day. About 150 children receive one-half pint of milk free each day. Last year the society furnished milk to 1,000 children, with 350 being served free.

—Sault Ste. Marie, Mich. All boys in the high school have been examined by physicians of the city. A continuing health record is kept from year to year showing the progress made. All girls desiring to use the swimming pool are required to pass an examination and to file a health certificate. This means that practically every pupil in school has a physical record on file.

SCHOOL BOARD NOTES.

—President Ryan of the New York City school board has asked the city board of estimate for extra funds for the schools, amounting to \$1,010,300 for the year 1923. The board has agreed to relinquish toward this amount, \$516,000 from a surplus of last year.

The \$1,010,300 which has been requested of the board of estimate, is to be divided among the schools as follows:

Day and elementary schools, \$300,000; day high schools, \$600,000; parental and trade schools, \$3,200; vacation pay for per diem teachers, \$12,000; evening trade schools, \$20,000; evening high schools, \$25,000; evening elementary schools, \$50,000.

—New York, N. Y. The name of Abraham Lincoln has been given to two schools in Brooklyn Borough. The New Utrecht High School will henceforth be known as the Abraham Lincoln High School, and the same has been given to P. S. 171 of Brooklyn.

—Pittsburgh, Pa. The board of education, by unanimous vote on November 13th, fixed the 1923 tax levy at eleven and one-half mills, which is unchanged from this year as recommended by the finance committee.

Although the tax levy will be the same next year, the estimates of expenditures are \$414,000 higher, an amount expected to be absorbed by increased valuations. Where the mill tax in 1922 yields \$850,000, that of 1923 is expected to yield \$890,000, or a 4.7 per cent increase. Taxes, it is estimated, will be 90 per cent collectable so that the tax has been levied on this basis.

—Indianapolis, Ind. A subcommittee of the education committee of the local Chamber of Commerce has undertaken a study of the one-story type of school building. The committee inspected two buildings at Fort Wayne as a part of the survey it is making on the advisability of erecting this type of building. The committee is composed of three members, headed by G. A. Millet, chairman. The committee in its work, seeks to determine whether the one-story type of building is more economical or more adapted to school needs than the usual two-story building.

—The building committee of the Indianapolis school board has reported on proposed improvements for nine schools. The total amount to be expended on improvements is \$1,608,000, with an additional \$180,000 for assembly halls.

—Berkeley, Calif. Nearly \$400,000 more than was voted by the taxpayers in the bond election of 1919 have been expended by the board on school structures and improvements, according to a recent report of the business manager.

The report shows that owing to the decreased value of the dollar in the period in which the schools were built, building and repair activities totaling \$165,691 were not carried out in the grammar schools of the city. The report also shows that the bond fund was supplemented by money derived from the sale of old buildings, land exchanged, and bond premiums. The board also obtained \$333,000 from the annual tax revenues to be utilized in the building program.

Of the \$333,000 diverted from regular school revenues, 67,000 were spent for land and im-

provements, \$129,000 for new buildings, additions and alterations, and \$137,000 for furniture and equipment.

—Denver, Colo. The board of education has received bids for the construction of the new administration building. The structure will be a two-story, fireproof office building and will cost about \$150,000. The building is designed to provide accommodations for all the executive and administrative offices of the school district, and will embody all the newest features of office construction.

—Indianapolis, Ind. Seven auditoriums which are planned to be built in connection with seven of the eight new grade schools and additions, as voted by the board recently, will cost \$210,000 according to estimates of the building committee. The entire building program will be in charge of Mr. Jacob Hilkene and will involve an expenditure of \$1,788,000.

—A movement to provide and equip better rural schools in Kentucky, through the use of a special fund to be obtained later, has been announced by Dr. John W. Carr, state high school supervisor. The fund is to be similar to that established by Julius Rosenwald for the construction and maintenance of colored schools in the South. Under the plan, existing school-houses will be improved and modernized and numerous communities will be provided with new schools for the education of the country children now without these facilities. The trustees of the fund will cooperate with the schools and other agencies, but the control and management of the schools will remain as at present.

—New Albany, Ind. The school board has asked the city council for authority to issue \$25,000 in bonds for the completion of the State Street School. It was pointed out that an additional expenditure was made necessary at the beginning because of difficulties encountered in the foundation work, and the fact that the contract did not cover architect's fees, grading or completion and equipment of second-story rooms.

—John W. Carr, state high school supervisor of Kentucky recently announced that a privately subscribed fund would be at the command of the authorities for the purpose of improving the rural schools of that state.

This Taper Does the Trick

Sagless

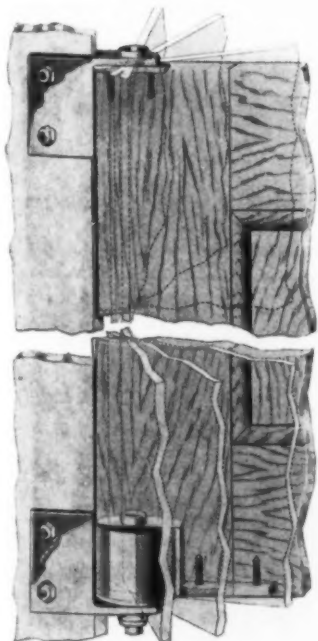
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Adjustable Spring Tension

Details of Application

To align the door or obtain regular or reverse action, simply unscrew set screw at bottom of hinge, raise hinge slightly from tapered socket support, move door to point of action or closure desired, and tighten set screw firmly.

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A small wrench enables this door to be set for any position, open or closed without dismounting the door. The spring tension is adjustable to any desired conditions. Their easy-closure springs have been developed especially for lavatory door use.

Every detail has been carefully thought out and worked out to make the Lawson hinge the best spring you could possibly specify. The proof of Lawson Universal pivot hinge superiority rests in the thousands being bought yearly by contractors who know their value.

They can be set to stand ajar at any desired opening in or out—either right or left hand—for marble, wood-jamb or pipe standard construction—in fact, for any type door where service is demanded and long life essential.

That's why the Lawson pivot spring hinge is rightly called the Universal hinge. Naturally it is the only hinge for lavatory door use. Being hung top and bottom it can't sag as long as the door lasts. This really amounts to the same thing as being guaranteed for several generations.

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The only spring hinge that can be set to hold door open at any position either in or out



ADDITION TO HUFFMAN SCHOOL, DAYTON, OHIO.

THE SCHOOL BUILDING PROGRAM OF DAYTON.

(Continued from Page 68)

There is a stationary cleaning system with outlets on all floors.

The electrical installation is such that each room is on a separate circuit and all electrical trouble can be instantly located in the cabinets. There are two of these on each floor. The lighting fixtures are enclosed Holophane units.

The windows are interesting in that they have balanced ventilator steel sash, with the lower unit hinged at the bottom and swinging in. This prevents drafts.

The cost of the building complete, with walks, approaches and drives, was \$354,000. This makes a per cubic foot cost of 32.5 cents. The cost per pupil is \$440; and per classroom, \$17,800. It is interesting to compare the new Jackson school with the standards set up by the National Education Association's Committee on Schoolhouse Standards:

National Averages	Dayton Values
12% Administration	11%
50% Instruction	54%
3% Accessories	1%
20% Stairs and Corridors....	20.4%
10% Walls and Partitions....	11%
5% Flues	2.6%

A study of this comparison shows that the new Jackson school was built according to the most approved standards.

The work of the construction department in the Dayton school building program has been confined to the designing and erection of additions to grade buildings. Many of these additions have presented real problems. The Huffman School, which is illustrated in this article, was perhaps the most difficult to build, due to the very high ceilings in the old building. They were sixteen feet high. Briefly, the outstanding features of the various additions are as follows:

The Patterson School is one in which a great deal of attention is paid to pageantry. The patriotic pageant of the Patterson School has attracted more than local attention; hence, it was necessary, in the erection of the addition, to give special care to the auditorium.

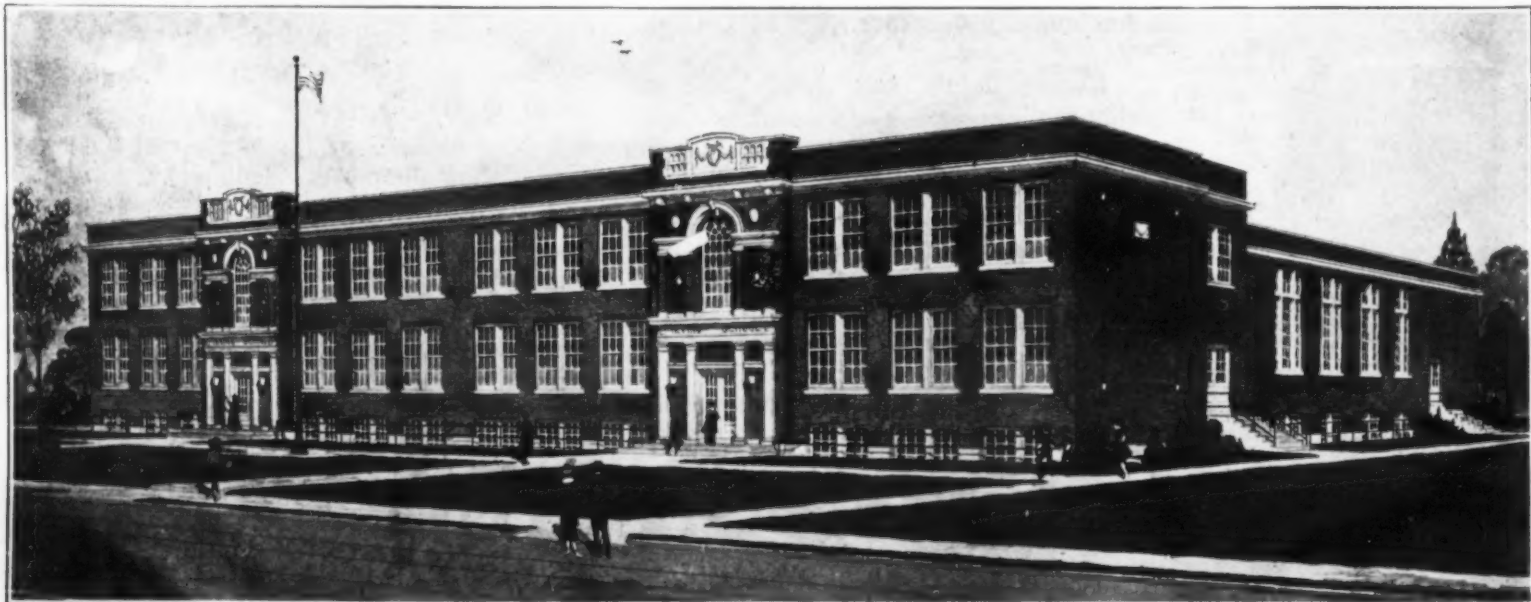
The addition to the Patterson School contains ten classrooms, an auditorium and gymnasium and the usual number of rest rooms for teachers and pupils. The ground floor contains rooms for domestic science and manual training.

The auditorium of the Patterson School is located on the first floor, with a balcony opening to the second floor. The stage of the auditorium is so built that it may be used as a gymnasium. The stage and the gymnasium are located on the same level but are separated by a curtain and by a folding-door partition, twenty feet high. When this is thrown open, it gives a stage and a gymnasium 42 feet in depth and 56 feet in width. This not only gives opportunity for indoor games and gymnasium work, but makes provision for large choruses and for the patriotic pageant which, as was stated before, is one of the distinctive features of this school. The capacity of the auditorium, including balcony, is 900. Should it become necessary, the folding doors could be closed and the auditorium and gymnasium used at the same time.

The total cost of this addition, including alterations to the old building, was \$201,120, or 29 cents per cubic foot.

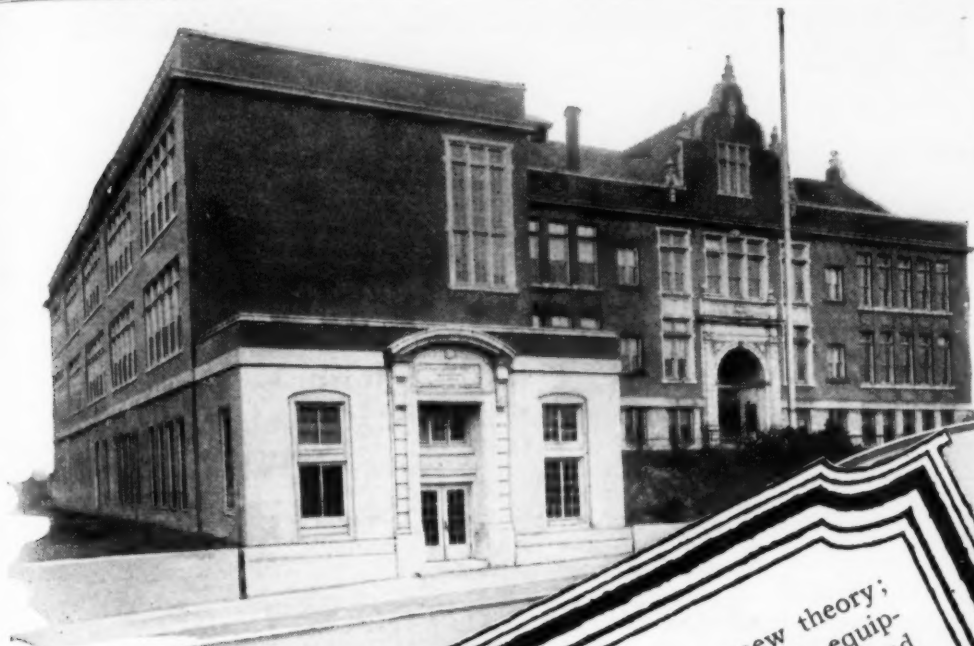
The addition to the Huffman School, which is illustrated in the cuts in this article, contains eight classrooms, in addition to rooms for domestic science and manual training. It also has an auditorium with stage and dressing

(Continued on Page 125)

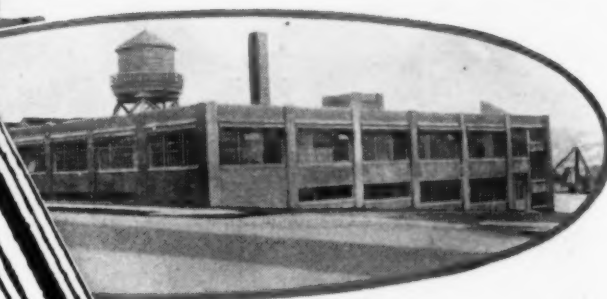


IRVING SCHOOL ADDITION, DAYTON, OHIO.

THE GREENWOOD SCHOOL SEATTLE DUNHAM HEATED THROUGHOUT



The Greenwood
Grade School



Shops
Building

Dunham Heating Service does not offer a new theory; does not call for any experimenting or any new basic equipment. The principles of operation have been recognized and accepted as standard by architects, heating and ventilating engineers and builders for many years. It does make use of standard boilers, standard piping and radiators — and uses them more efficiently.

Dunham Vacuum System

THE Dunham Vacuum System utilizes either exhaust steam or live steam. Each radiator is equipped with a Dunham Radiator Trap which automatically frees the radiator of the condensate (water from condensed steam) and air, but retains within the radiator all the live steam. The condensed water and air are drawn through the return piping to the basement by a vacuum pump in the boiler room. The air is released to the atmosphere, and the water (which being condensed steam is, of course, hot) is returned to the boiler and used to create more steam. This application of Dunham principles is successful in any building with extended areas of radiation, such as office buildings, hotels, municipal buildings, etc.

Dunham Return System

WHEN it is not necessary to create a vacuum in order to keep the steam in circulation, but where, of course, the same efficient removal of condensate and air from the radiators is essential, The Dunham Return System is used. This system, like the Vacuum System, utilizes steam at any desired pressure up to, but not exceeding, 10 pounds. An operating pressure of 1 to 2 pounds is recommended and in the average installation is usually sufficient. This system is particularly suitable for medium size buildings of various types where vacuum is not desirable. As in the Vacuum System, the water is returned to the boiler. The Dunham Return Trap, or a Return Pump, however, is used instead of a Vacuum Pump.

This Service is based on the Dunham Radiator Trap — an automatic device that 20 years ago revolutionized low pressure steam heating, and made it possible to get more heating comfort per ton of coal — without noise and without leaky radiators.

The trap operates on the thermostatic principle. It positively frees the radiators, blast coils, and piping from the trouble-making air and water, gives the steam a chance to circulate freely at low pressure.

Dunham Heating Service co-operates with you, with your architect, heating engineer and with your builder. It inspects installations, upon request, when finished and thereafter, when service is needed. This part of Dunham Service is exceptional, and extremely valuable — for it incorporates SERVICE AFTER THE SALE.

New and existing steam heating systems can be Dunhamized at a cost which is low compared with the extra heating comfort obtained. We suggest that you lay the burden of proof right on us at once. Tell us your needs and we will gladly explain Dunham Service in all its details.

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Dunham Heating System
for every school need.*

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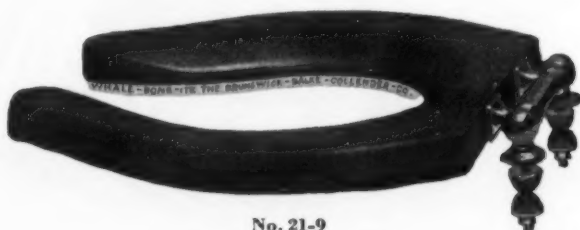
See that *heavy* covering. No amount of cleansing or scrubbing will wear through it.

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If you cannot secure locally, ask Seat Department of makers.

(See Sweet's for detail catalog.)

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These Murdock Anti-freezing Fountains should be placed in every school yard.

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FOOL PROOF CLIMATE PROOF

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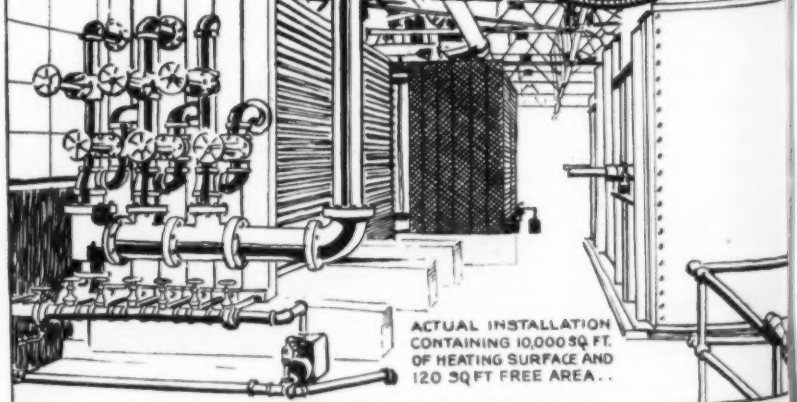
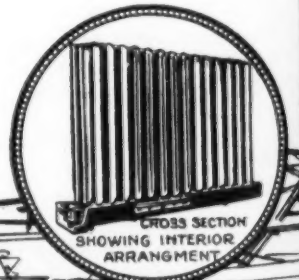
Bayley Chinook Heaters

are built on the "Tube-Within-a-Tube" principle, every tube a complete radiator in itself, free from water hammer, return bends, elbows and nipples. Any tube can be removed without interfering with any other tube. Can be shipped K. D.

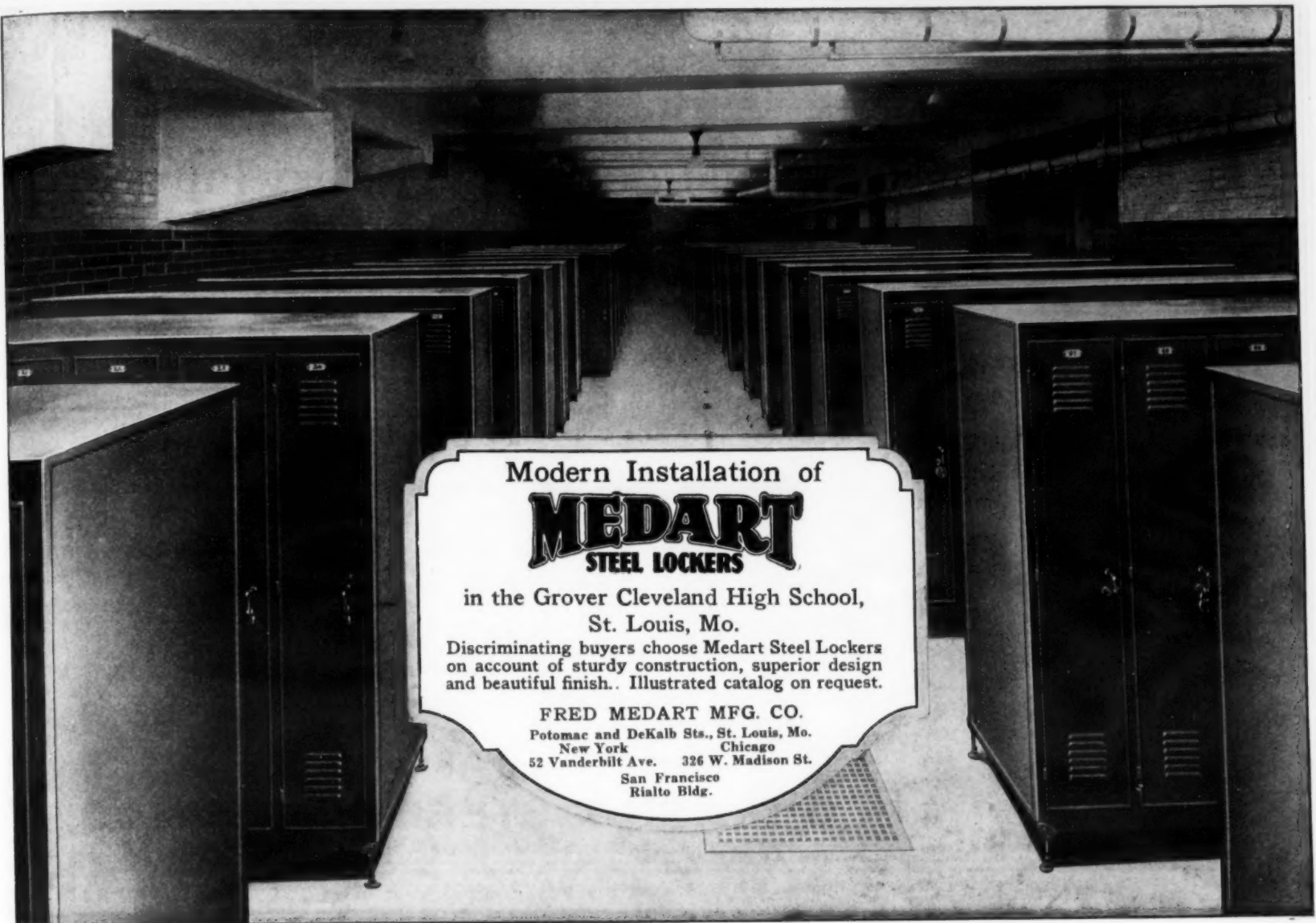
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(Concluded from Page 122)

rooms and a separate gymnasium. The seating capacity of the auditorium is 800. The difficulty in the erection of this addition is well illustrated by the photographs and architect's drawings, which indicate the high ceilings in the old building. The total cost of this addition was \$190,650, or 25.5 cents per cubic foot.

The addition to the Irving School contains eight classrooms, an auditorium, a gymnasium and rooms for domestic science and manual training. The auditorium has a capacity of 650. There is nothing in this addition which is of unusual interest except possibly the fact that the addition was designed to completely hide the old building. The total cost of new construction, including the necessary alterations to the old building, was \$140,000, or 24.5 cents per cubic foot.

All of these additions are heated by the warm air blast system, automatically controlled. The air is humidified and forced into the rooms at the desired temperature. The construction department favors this type of heating as it eliminates all piping and radiators.

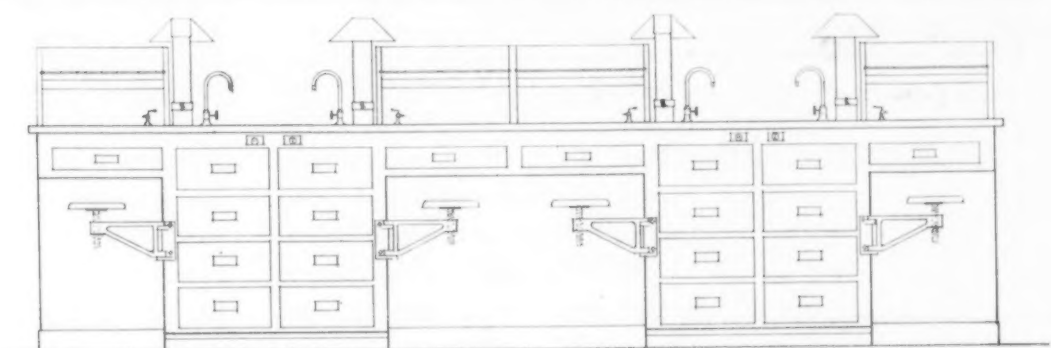
THE PLANNING OF LABORATORIES.

(Continued from Page 59)

completed construction projects are stored in the ample compartments of an open case located near the door opening into the corridor. Along the wall opposite the work-bench is a refrigerator connected with a floor drain pipe, and a large wash-bowl with water-tap above.

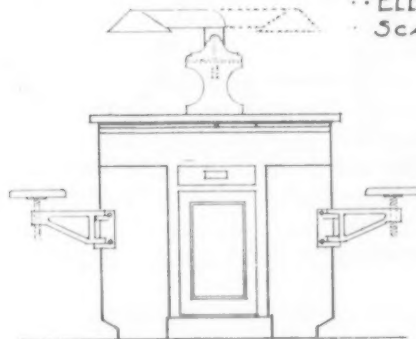
A Club Room.

In the present day life of the high school the science club undoubtedly should hold an important position. By encouraging the formation and growth of science clubs one may make excellent capital of the gang instinct which is so



ELEVATION STUDENTS TABLE

SCALE FT. 0 1 2 3 4 5 6 7 8 9 10



END ELEVATION

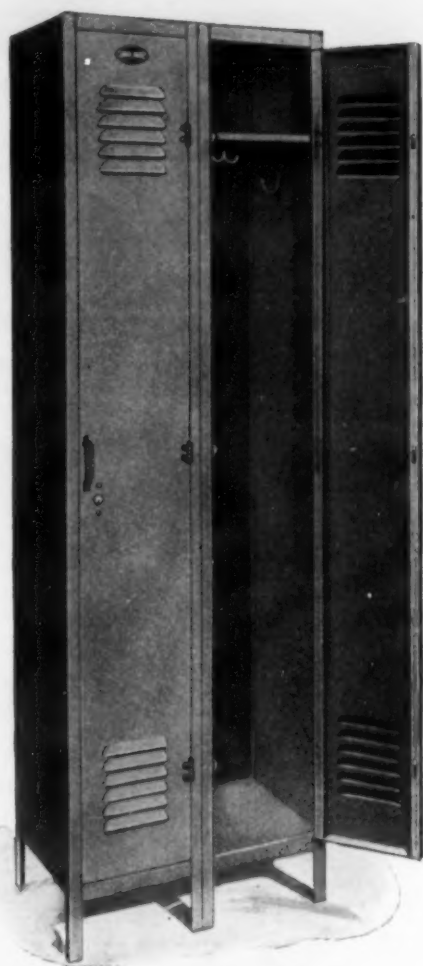
strong in children of secondary school age, and thus bring about an enrichment of the course of study on the "high-grade play level." In a large school a small room should be provided as headquarters for the various science clubs. Various exhibits of materials collected by the club members may be stored in cases several of which should be provided in the room. The radio club will need an aerial on the outside of the building and a small room within for sending and receiving. This room could very appropriately belong to the science group. A

dark room should be available to the members of the camera club. Equipment for developing, printing, enlarging, and coloring pictures is desirable.

Science Garden.

The role of the outdoor laboratory, or science garden, in the work of the department is a very important one. Where such a plot is not available or cannot be properly equipped, definite modifications in the plans for the general science and biology rooms are necessary to provide accommodations for living plants and animals within the classroom. Such accommodations are never satisfactory, however, and an outdoor laboratory is, in the opinion of the writers, an absolute essential. Where ground is not available conveniently near the laboratories, the roof may be utilized.⁵ The space available in these plans is about 300'x120', with southern exposure, enclosed on two sides by those wings of the school building which house

⁵The new Theodore Roosevelt high school in Oakland has included in its plans a science garden and animal yard on the roof.



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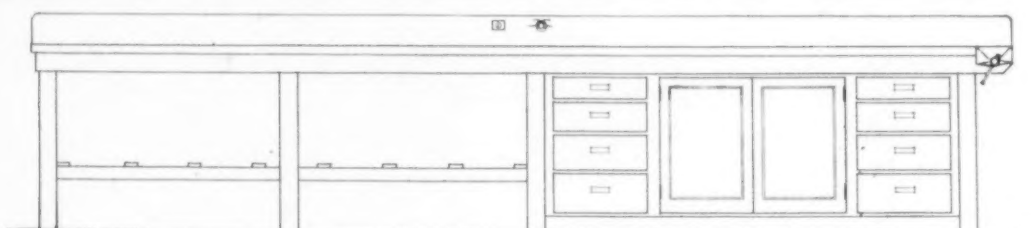
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AURORA, ILLINOIS.



ELEVATION WORK BENCH No 9
SCALE FT. 1 2 3 4 5 6
PLATE 6.

the science department. The garden will have a pool, an aviary, animal houses (for rabbits, poultry, etc.) and a small conservatory, with a toolroom and workshop attached. The garden will be laid out to provide school garden plots for the seventh grade pupils and experimental plots for the older classes; the whole to be bordered with shrubbery and vines, and securely protected by a substantial fence.

Summary.

The points which the writers desire to present for special consideration in this paper may be summarized as follows:

(1) Close cooperation between architect and teacher helps each to a better understanding of the other's problems. This cooperation can be brought about by the wise administration of a superintendent of schools who seeks to utilize in fullest measure the contribution which the classroom teacher can make to the development of educational theory and practice.

(2) Laboratory facilities are essential for any satisfactory teaching of the natural sciences throughout the secondary schools.

(3) These facilities have generally been more elaborate than necessary for the purposes of science teaching in the secondary schools, and more expensive than future school building programs, which must care for a greatly increased enrollment, can afford.

(4) The provision of separate laboratories and lecture rooms has increased this expense, and has at the same time diminished the flexibility of the classrooms and tended to accentuate an undesirable separation between classroom and laboratory operations. As a means of overcoming this tendency a combined laboratory-classroom is suggested. The plans here described are designed for a general purpose six-year secondary school, not for a technical or trade school.

COMMUNITY SCHOOL AT RENVILLE.

(Concluded from Page 61)

aid, approximately \$2000; transportation aid for pupils, not to exceed \$4000.

Transportation.

The school board at Renville has laid out seven routes at the present time and the school busses carry an average of 125 children back and forth each day. The busses are all owned by the school district. They are at present all horse-drawn and are provided with runners as well as wheels. Blankets and soapstone foot-warmers are also furnished by the school district.

Each driver is required to give a bond to insure the faithful performance of his contract. He must comply with all rules laid down by the state department of education as well as the

local school board, and is under the immediate direction of the superintendent of the consolidated school.

Cost of the Building.

The various contracts for this building were let in May, 1921. The cost per cubic foot was 29.6 cents, in which amount is included the contracts, the architect's fees, and all material and equipment not included in the original bids accepted by the school board. The cost per pupil, based on the normal number for whom the building should provide, is \$573.57. Either one of these unit costs are low, when the character and class of building is considered, as well as the time during which it was constructed. The cost of the construction constitutes 72.3 per cent of the total amount, the heating and ventilation 17.2 per cent, the plumbing 6 per cent, and electrical equipment, including all fixtures, program clocks, and interphone system 4.5 per cent.

RHODE ISLAND'S RANK AMONG STATES.

The rank which the state of Rhode Island secured in the Russell Sage Foundation was the twenty-sixth in the list of states. According to figures presented by the state educational department the state has increased its index for all tests from 56.33 per cent to 61.09 per cent, or risen in rank to ninth place. This claim is demonstrated in the recent seventy-sixth annual report of the state commissioner of education.

This report, too, contains portraits of all former and present members of the state board of education. It also provides a list of the state commissioners of the public schools as follows:

Henry Barnard	1845-1849
Elisha R. Potter	1849-1854
Robert Allyn	1854-1858
John Kingsbury	1858-1859
Joshua B. Chapin	1859-1861
Thos. W. Bicknell	1861-1875
Thos. B. Stockwell	1875-1905
Walter E. Ranger	1905-1922

The report also serves as a souvenir edition of the fiftieth anniversary of the creation of the state board of education.



CASS TECHNICAL HIGH SCHOOL, DETROIT. MALCOLMSON AND HIGGINBOTHAM, DETROIT, ARCHITECTS; McCALL, SNYDER AND McLEAN, ENGINEERS

MATCHING UTILITY WITH ENDURANCE

The Cass Technical High School at Detroit, with laboratory and classroom accommodations for four thousand students, embodies many advanced principles in its sanitation and heating systems. In such school buildings, destined to serve for many years, long life in the equipment used is an important factor of

economy. Endurance unites with utility and beauty in Crane sanitation fixtures. Crane lavatories for schools, for instance, equipped with Triumph self-closing faucets to prevent waste of water, withstand the most severe usage. The large, sturdily constructed waste fixtures, designed for easy cleaning, are also quick draining.

CRANE

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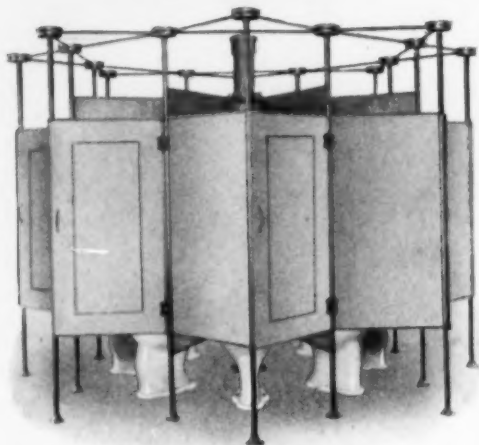
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Jos. W. Baker, Architect.

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Public School No. 4, Albany, N. Y., destroyed by fire April 30, 1922. No dead children; fire not in school hours. Loss of building \$100,000; no insurance. Albany "got off cheap."

Sixty-five per cent of our schools are of this type or worse; wooden interiors with brick walls; that is to say, a good stove. There are five school fires every day. The law compels children to go to school.

HOW ABOUT YOUR SCHOOLS? IS IT A POTENTIAL CREMATORY LIKE THIS? A FIRE-PROOF SAFE IS NONE TOO GOOD FOR YOUR BONDS. IS A FIRE-TRAP GOOD ENOUGH FOR YOUR CHILD?

The above is a poster sent out by the National Fire Protection Ass'n, 87 Milk St., Boston, Mass.

Do not ease your conscience by erecting on your school house building inadequate steel ladders or steel stairway fire escapes.

A moment's serious consideration will bring quick realization of the fact that in case of actual fire, a large percentage of the inmates would be burned to death or seriously injured before they could reach the ground on a steel ladder fire escape.

A steel stairway attached directly to the school building quickly becomes overheated, completely shutting off the escape of the inmates of the burning building.

The slight additional cost of a modern, safety Standard Spiral Fire Escape does not warrant the tremendous risk involved in purchasing the "inferior types" of fire escapes as a "make shift" protection for the safety and welfare of the children under your jurisdiction.

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A BUSINESS MAN'S SCHOOL INVENTORY.

(Concluded from Page 43)

Other significant facts are these: 65 per cent of the cities have school physicians; about 60 per cent have dental clinics; about 85 per cent have school nurses. The steady increase in dental clinics and school nurse systems in the past few years has been among the notable developments in American schools.

Sanitation and Safety Deficient.

The report epitomizes its findings on buildings and equipment in the following terse paragraphs:

1. That not enough attention has been paid to erecting the type of building which will stand the test of years.
 2. That we are not giving our children a square deal in not protecting them from fire.
 3. That many communities tolerate defects in the school buildings which make for impaired eyesight; weak lungs; and the spread of disease.
- Among the elements being developed in the communities which have the most modern school systems are:
1. Properly planned buildings rightly located and surrounded by adequate open spaces.
 2. Efficient health organization, including school physicians, dentists and nurses.
 3. Thorough medical examination of all children before admission to school.
 4. Provisions for nourishment not only for malnourished but for all elementary school children.
 5. Outdoor classes and schools.
 6. Health instruction and supervised play.

The age of school instructors receives some attention. Of 579 buildings of which the date of construction was reported 1 school was built prior to 1840; 2 between 1840 and 1850; 3 be-

tween 1850 and 1860; 23 between 1860 and 1870; 49 between 1870 and 1880; 79 between 1880 and 1890; 94 between 1890 and 1900; 124 between 1900 and 1910; 142 between 1910 and 1920; 62 between 1920 and 1922.

The life of school buildings erected from now on should be much longer than those of an earlier period if the proper attention is paid to essentials at the time of erection. Some of the more important of these follow:

1. Location of the school building in the proper relation to the general city plans and trends of population.
2. Sufficient school grounds for adequate play space, light and ventilation covering possible future additions as well as present needs.
3. Provision for future additions which will not interfere with good design, light and ventilation.
4. Adequate lighting, fire resistive materials, etc., so that even if it becomes necessary at a later time to change room arrangements the general structure of the building need not be changed.
5. Architectural design of simple, effective type.

Stairways, Lighting, Ventilation.

Out of 398 schools on which reports on stairways are made, only 66 have all the stairways enclosed in fire resistive material, 332 do not. Eighty-eight per cent of the schools have stair landings; and 85 per cent do not have sharp corners or obstructions on the stairways.

Twenty-three schools or 5½ per cent of all those examined as to lighting have insufficient light in all rooms. In addition 442 rooms in various schools are reported to have insufficient light. Forty-six rooms have windows children must face. In eight schools all the rooms have cross lights and in addition in 641 rooms there

are cross lights. When out of a comparatively small number of schools, and these in the more progressive communities, so much unsatisfactory lighting exists, it is easy to imagine the damage done yearly to the eyes of school children all over the country.

Approximately 23 per cent of the schools investigated were found to have unsatisfactory ventilation. Of the total number of 629 schools reporting on this question windows were used for ventilation in 203, artificial ventilation in 382, and both systems in 44.

The toilet rooms in 554 schools were found to be adequately lighted; those in 41 were not.

School Physicians and School Nurses.

In 62 of the 160 cities all the children are given a medical examination upon their admission to the schools. In 98 of the cities no such examination is given. The cities from 50,000 to 100,000 make the best showing, 61 per cent giving the medical examinations. The worst showing is by cities between 15,000 and 25,000, only 25 per cent giving examinations. The approximate percentage of cities of the other classes giving examinations is as follows: below 5,000, 29½ per cent, between 5,000 and 10,000, 53 per cent, 25,000 to 50,000, 30½ per cent; 100,000 to 300,000, 37 per cent; above 300,000, 33 1/3 per cent.

One hundred three of the cities included in this survey have school physicians and 54 do not. More than 1/3 of the cities below 5,000 do not have school physicians, but in the classes above 5,000 the proportionate number of cities having physicians does not vary greatly. About 9 per cent of the physicians employed in the schools of these cities are on full time and 91 per cent on part time. Ninety-three of the cities have dental clinics in the schools and 66 do not.



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ALUNDUM STAIR TREAD TILE has a plane surface without grooves, corrugations or depressions and a rounded nose that remains slip-proof always.

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One hundred thirty-five of the cities have school nurses and 23 do not. The maximum number of pupils whom a nurse can look after with any degree of thoroughness is 3,000, and 2,000 is a much better number. The average number of pupils to each nurse in cities which employ only one nurse is 2825 and in cities employing two or more 3037. The greatest number of pupils to one nurse is 17,835 in a western city—the smallest number is 350 in a community of 1977 in Pennsylvania.

A number of the cities which do not have school physicians have school nurses. Either nurses or physicians regularly inspect the children for defects or incipient illness in 132 of the 160 cities.

Open Air Schools and Nutrition.

Forty-one cities report that they have open air schools or classes and a number of others state that they will establish this system in the near future. The fresh-air movement in the schools is growing and its vital importance is more and more realized.

In answer to the question, "Do the schools all have adequate playgrounds?" ninety-one answer no, and 68 yes. The smaller cities have of course the best showing. Of those under 5,000, 71 per cent report that all their playgrounds are adequate; those from 50,000 to 100,000 only 30 per cent have adequate grounds and in those above 300,000 the percentage falls to 11. Fifty-four of the cities have no supervisor in charge of the playgrounds.

In 102 of the cities scales are provided in all the elementary school buildings and in 56 they are not. Only 34 cities send home the child's weight record on the monthly report card.

Thirty-two of the cities provide a hot lunch or hot dish for each child in the elementary schools. Eight have milk available for all the

children morning and afternoon; two provide it in the morning; 94 have milk available for the undernourished children.

The malnourished child is retarded physically and mentally so that he does not have a fair chance in life. A hurried breakfast and a cold

"box-lunch" eaten at the school are not conducive to health building and nutrition experts agree that the child should have milk in the middle of the morning, a hot lunch or hot dish with the lunch at noon, and if possible some nourishment in the middle of the afternoon.



THE CLINIC, ELEMENTARY SCHOOL, LAWRENCE, MASS.
Jacobs E. Allen, Architect, Lawrence, Mass.



From the tunnel entrance, freight is whisked by electric elevator, to the various storage floors.



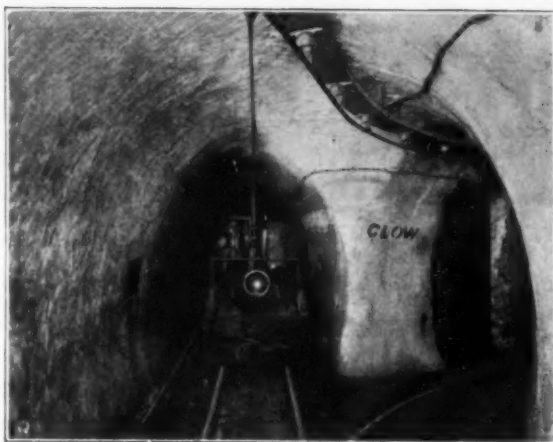
Goods come to the warehouse by lighter and freight car, and giant cranes carry them in.

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IN Civil War days this was the mysterious route by which escaped slaves made their way to Canada and freedom.

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ment, fittings to the first and third, enameled iron and porcelain to the fourth, closets, seats and tanks to the fifth, brass goods and

trimmings to the sixth.

There, arranged for instant access, they await the order slip which will send them on their way again.

Next month I shall tell something of what our packers do, and the expert inspection which means so much to the plumber, architect and owner.

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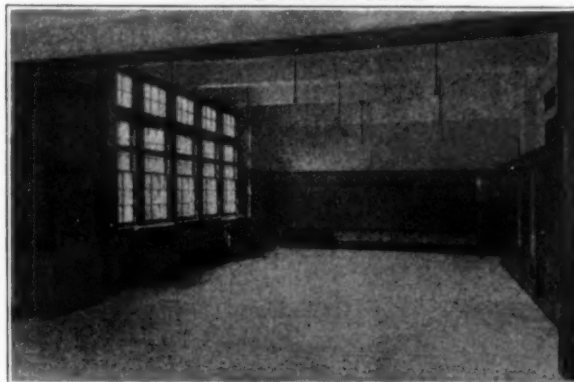
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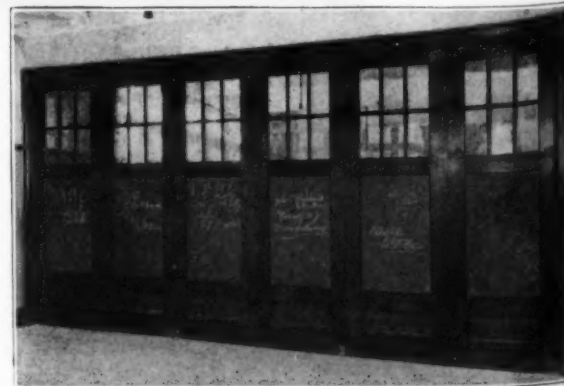
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Architect

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(Continued from Page 53)

Fourth, on the rostrum of the auditorium was displayed a large chart, designed in the form of a thermometer representing each month of the school year. As the monthly reports were tabulated, the status of the school, whom we represented as being a patient suffering from a severe attack of "tardy fever", was charted graphically, in colors.

Fifth, the teachers stressed the point in their rooms, and made it a practice to have some rather interesting discussion take place every day, about ten minutes before time actually to commence school work. If a child still persisted in being tardy, a visit or letter to his parents usually helped. Practically every parent interviewed or corresponded with promised and gave us full support.

The results exceeded anything we had deemed possible. The interest in "keeping our flag up" became so intense, and produced such rivalry amongst rooms striving to have a larger flag than any one else had, and in securing the privileges a room with a perfect record was granted, that a tardy pupil became an exceedingly unpopular individual in his room. Some boys even resorted to physical arguments in treating constant offenders; and it took much persuasion and suggestion in several instances to convince an irate group that the fellow who had made them lose the flag would likely repent without being "bucked". This movement was short-lived, however; and as a matter of fact, the social condemnation was even more potent an agency. The statistical proof of the school's improvement follows:

Month Ending in:	Tardies Reported:
October	264
November	145

December	132
January	78
February	45
March	32
April	24
May	14
June	22

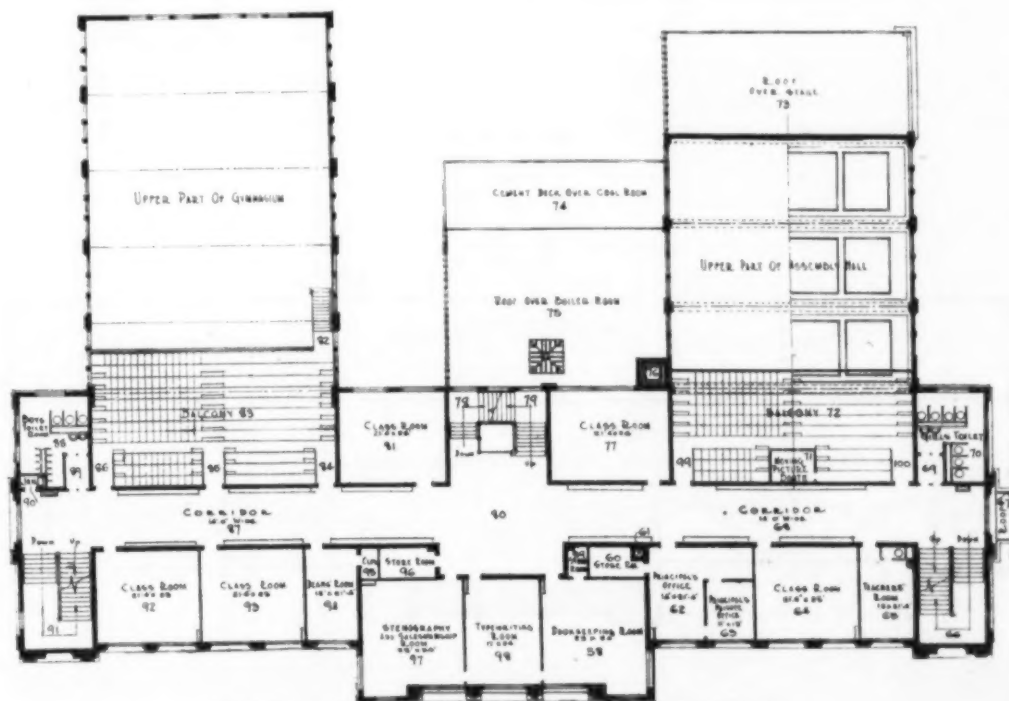
The school month ending in June had one more week than any other, and was marked by many showers occurring between 8 and 9:30.

The school has 23 classrooms in it, and the average attendance for the year was over 800. The results so far this year indicate that the improvement was permanent.

(Continued from Page 56)

obtained that, in accordance with the findings of the Committee of the National Education Association, should be approximately 50 per cent of the total floor area of the building.

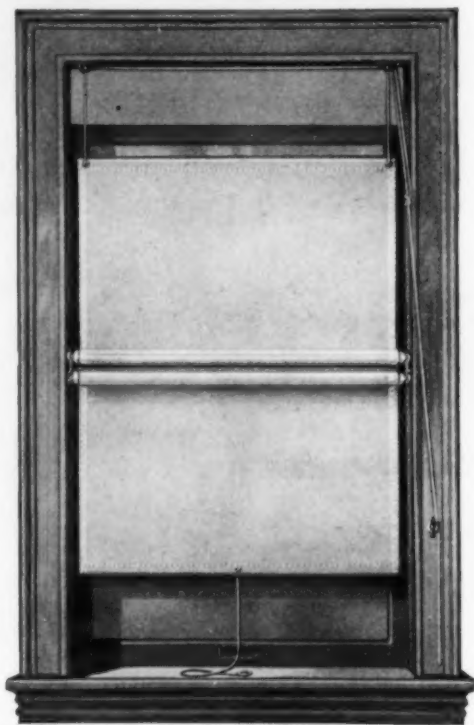
Therefore, by doubling the total square foot area of the instructional spaces, we have a total floor area of the entire school building, including walls, corridors, stairs, toilets, administrative offices, etc.



SECOND FLOOR PLAN, HIGH SCHOOL, OWENSBORO, KY.
A. F. HUSSANDER, Architect, Chicago, Ill.

MAXWELL'S SCHOOL SHADES

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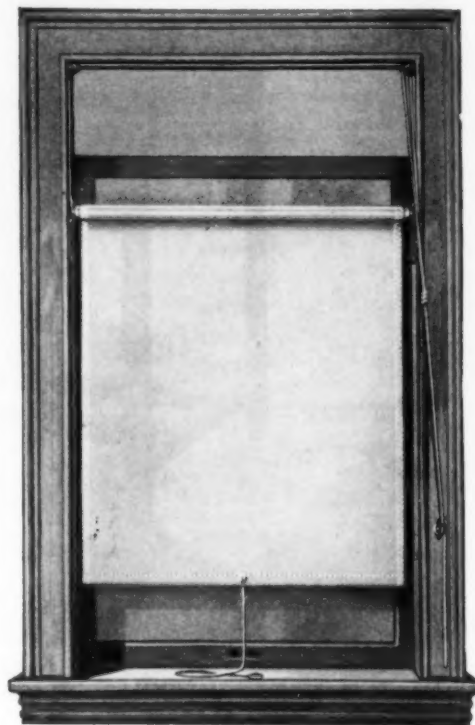
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KANSAS CITY

For service and quality use Maxwell's Dependable Window Shades.

A preliminary chart, similar to that in Fig. 1, can then be made to show the relative area of the various portions of the building, and also the approximate cubic contents of the building.

Outline Sketch Plans.

After all the data and information have been gathered and tabulated it is then time to begin the preparation of outline sketch plans for the building. These sketches need not be elaborate

or finished in detail or worked out in a complete manner. On the contrary, it is better if they are only skeleton plans which can be considered at a glance and the fundamental principles of arrangement seen without the distraction of minor details which appear on finished drawings.

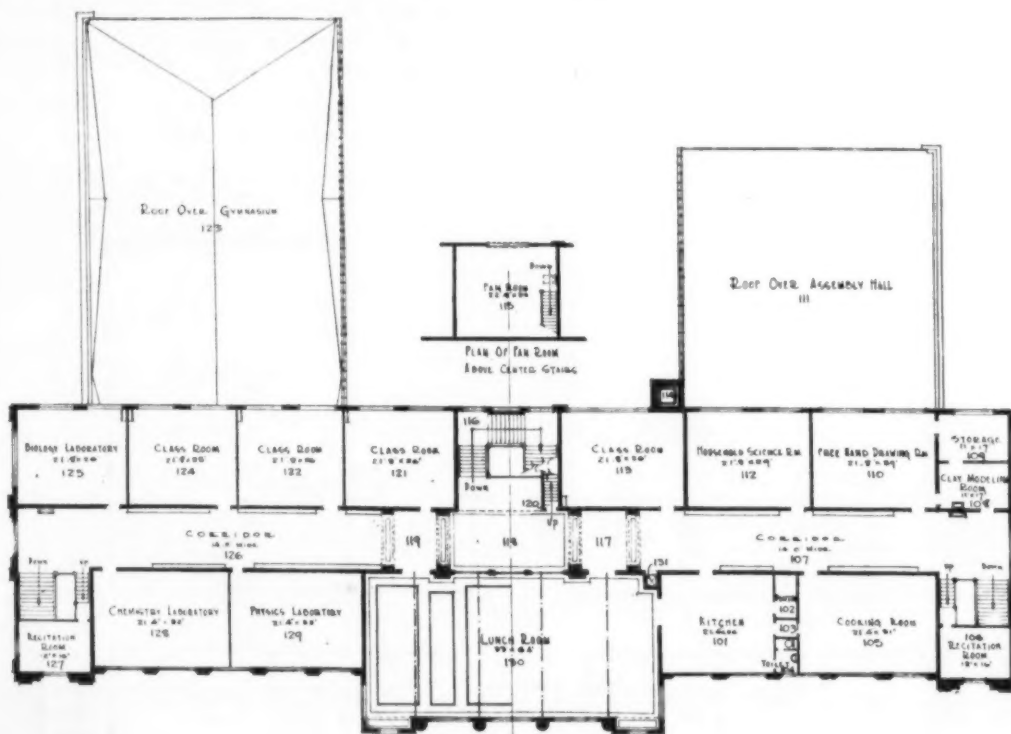
A series of sketch plans illustrating various arrangements and groupings of departments,

give the board of education and the superintendent an opportunity to study the larger elements of each scheme and by comparison to select the good points in each sketch. The architect can then work up revised sketch plans which will embody so far as possible all the good points of one sketch and as many as possible of the acceptable points of the discarded sketches.

In the accompanying illustrations are outline sketches of plans made for the Owensboro high school. The sketches illustrate only the first floor plan of each type of building proposed by the architect and very clearly exemplify the value of outline plans. The several schemes were worked out on fairly large scale and copies were furnished to the superintendent and to members of the board of education for study and suggestions.

After careful consideration and comparison of the relative merits and shortcomings of each scheme, the outline sketch plan E was selected for further development. Final sketch plans and exterior designs were then drawn and were submitted and approved by the board.

While the architect has in mind from the beginning some general idea as to the architectural treatment of the building, it is not until after the finished sketch plans have been practically decided upon that anything definite can be done with exterior elevations. In fact in school buildings which must comply with certain regulations as to sizes of rooms and amount of glass area, height of windows from the floor and from ceiling, it is indeed an interesting problem to design a school building that will have some degree of architectural treatment and at the same time express the uses of the building.



THIRD FLOOR PLAN, HIGH SCHOOL, OWENSBORO, KY.
A. F. Hussander, Architect, Chicago, Ill.

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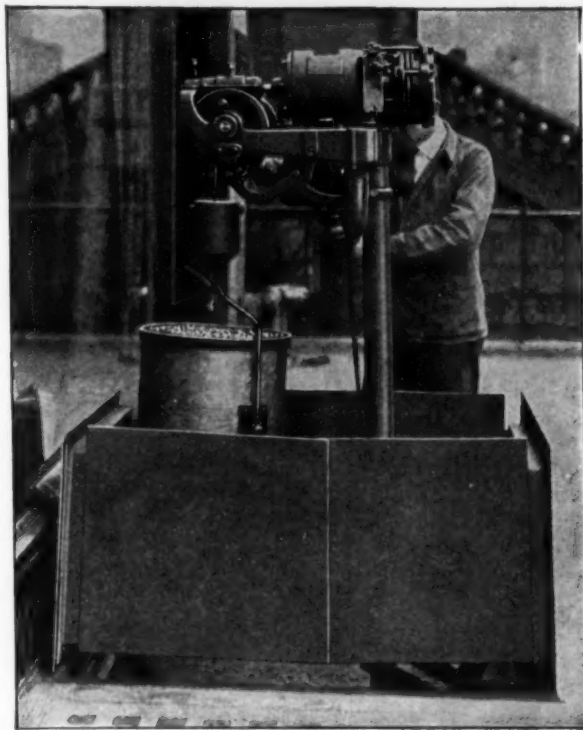
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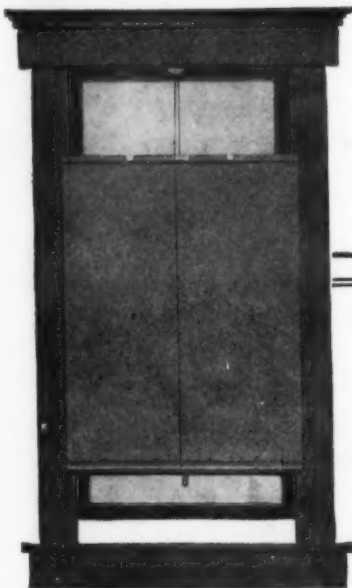
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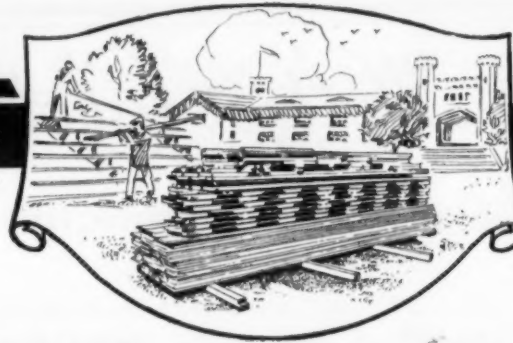
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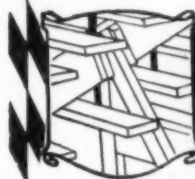
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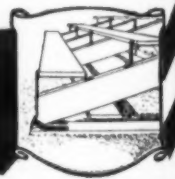
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Manufacturing Stationers Huntingdon, Penna.

HOW THE SKOKIE SCHOOL WAS BUILT.

(Continued from Page 37)

The corridors themselves are terrazzo and are lighted by skylights, the building being only one story high, except over the offices and loggia. The classrooms are 22' by 30', and are provided with skylights and arched windows. The skylights have easily regulated shutters. The window sills are of concrete to provide for window boxes. The radiators are set to one side of these window sills so that the heat will not destroy plants.

The wardrobes are in the rooms themselves and are of the type with upward sliding doors which never close flush to the floor, so that the air exhausted from the room passes up through the wardrobes into the attic, drying and ventilating the children's wraps. The sliding panels of the wardrobe doors are covered with cork carpet for the exhibition of the children's work. Similar cork carpet extends above the slate blackboards all around the room. The floors are maple.

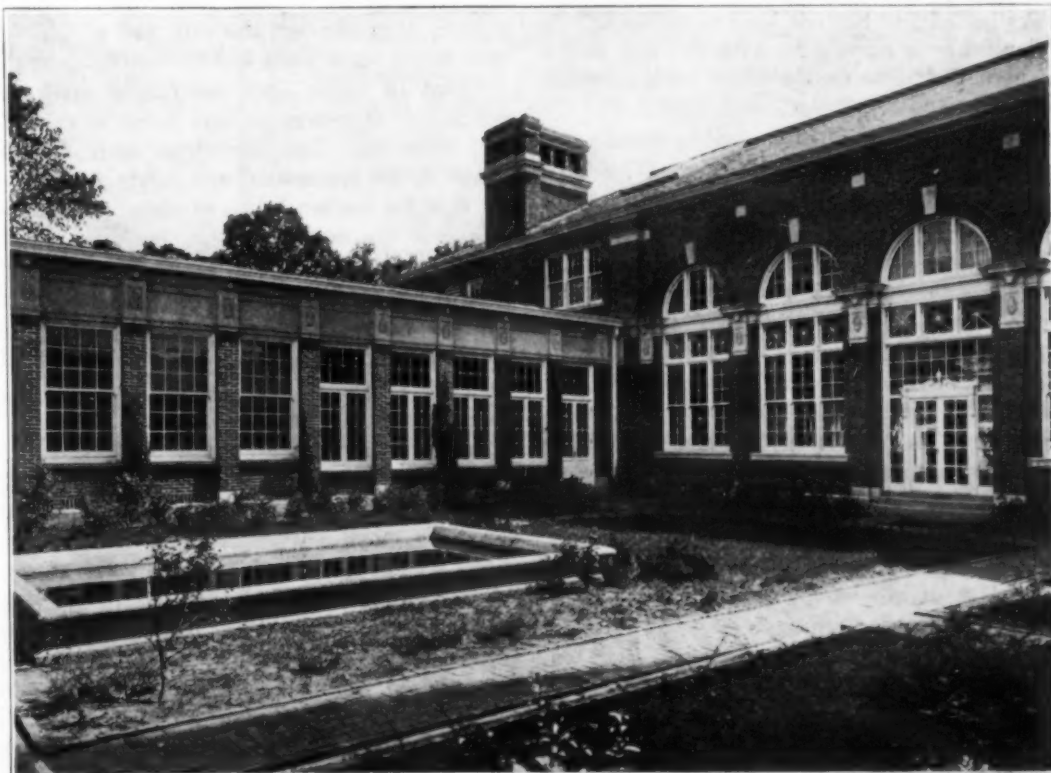
Special rooms include an art room with small pottery room and supply room opening off it, a large woodworking shop with a small forge room and finishing room off one end and print shop and lumber storage room off the other end. The print shop and forge room are shut off from the rest of the shop by glass partitions. The woodworking shop opens into the garden court where the children try out the boats they make in the cement pool.

Across the corridor from the shops are the cooking room, sewing room and general science laboratory, all opening into each other as well as into the corridor. In this way the meals prepared in the cooking room can be served on sewing room tables at lunch time, and the general science laboratory is available on the other side to the cooking girls. In addition to the

special rooms there are ten regular classrooms in the present wing.

The assembly hall is a beautiful, spacious room hung with russet velour and seated with opera chairs on a pitched floor. There is an orchestra pit and an organ loft, but as yet there is no organ. The gymnasium is on a level with the stage and is shut off from it by folding doors. A steel frame, from which may be hung curtains forming a cyclorama, extends back of

these folding doors into the gymnasium. By this means it becomes possible to open the folding doors and to have a stage as deep as any professional stage, while for ordinary school assembly purposes, the platform in front of the folding doors is amply large. The gymnasium itself has brick walls, maple floor, and skylighted ceiling. There is an office for the physical education director at one end and a supply room for gymnasium equipment.



THE GARDEN COURT, SKOKIE SCHOOL, WINNETKA, ILL.

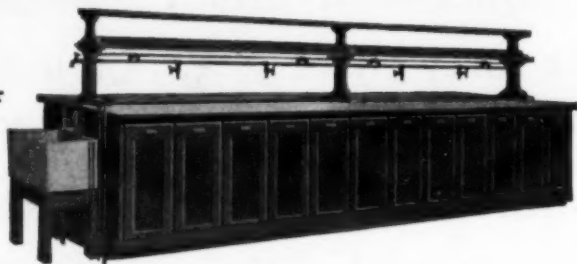
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Overhanging the assembly is a balcony seating 200 people. This balcony can be shut off from the assembly hall by folding doors, making a small auditorium which can be separately heated. It is provided with a platform and a Monogram piano and is used as a music room most of the time. Back of this balcony from the standpoint of people sitting in it, but in the front part of the building, is a library extending over the loggia and vestibule of the building. The library room is lined with bookcases, is skylighted and has windows to the front. It is flanked by a nurse's room on one side and a teachers' rest room on the other, each provided with toilet and lavatory.

The woodwork trim in the entire building is fumed oak and is decidedly effective. The decoration is flat paint, light brown on the dado, buff on the walls, and cream on the ceilings.

The school is equipped with movable desks. There is a master clock with electric secondary clocks in each room.

The heating system is of the split type, with radiators in each room. The air which is forced into the room is heated only to room temperature and is not superheated. The boilers are down-draft Kewanee boilers.

The building as a whole impresses one immediately by its dignified simplicity, its complete adaptation to the uses for which it is meant, by its lack of any waste space whatsoever, at the same time that nothing is crowded. School officials from other cities, architects, and the people of Winnetka themselves have all joined in the feeling that the building is a real achievement architecturally, as well as an indication of what a community that is really interested in the welfare of its children can do even in the face of very considerable difficulties.

AN EXPERIMENT IN MARKING.

(Concluded from Page 45)

whether or not he should accept credit for any work rated between the school's and the individual's failing standards.

At the close of the semester each student involved was invited to give an anonymous estimate upon his individual effort. Opinions varied widely. The principal's conclusions are:

"That raising the failing mark raised some apprehension in almost every case. This is evident even through the thin veil of indifference which some seem to experience.

"That in many cases the failing mark was not raised to a high enough point to create a real stimulus. The interviews with the students in the beginning was partly responsible for this, for too much was at stake with seniors to overdo the matter.

"That the very superior students had already set such a high standard for themselves that this scheme was unable to produce any noticeable impression.

"That a tone of satisfaction is evident in many cases that they could put through a proposition of this sort. It is probable that it would become a matter of considerable honor with students to meet a challenge like this especially when self-imposed.

"The experiment was new and very interesting to follow. The results were in no cases unpleasant for no students fell below the self-imposed failing point. In fact, almost all could have raised the mark higher with impunity. One student withdrew toward the close, made anxious by a poor month's record, but the final results showed that his fears were groundless. The scheme pleased the better half of the senior class and aroused no small curiosity on the part



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Board of Education, El Paso, Tex.,
5 installations;
Board of Education, Durham, N. C.,
2 installations.

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of those not admitted. In fact, several made inquiries as to the reason they were not invited into the original conference.

"I believe the plan possesses possibilities if tried on a large scale. This I am hoping to do."

THE NEW VOCATIONAL SCHOOL AT MADISON.

(Concluded from Page 65)

hall, while still others take care of the classes in filing, typewriting, stenography, accounting, penmanship, and spelling.

Though Madison has always been regarded mainly as an educational center, there was sufficient need for a vocational school to warrant an expenditure of \$550,000 on it. Of this \$400,000 was spent for the building alone, while about \$85,000 went for equipment.

The enrollment of the school has surpassed the expectation of any of its officials. In fact, there was immediately present a need for more likely to enroll for many years. This condition room, although the building had been planned to accommodate all the pupils that would be will be noticeably relieved by the opening of the east Madison high school which is now being erected but it is probable that just as soon as funds are available the remainder of the vocational school, for which plans are already drawn, will be begun. This last unit will give Madison a school covering a solid block—an ornament and a service to the town.

—Somerville, Mass. The school board recently voted to retain temporarily three married women who are teaching in the schools. At a meeting held in July last, the board decided not to renew the appointment of a teacher who was married. There are at present one hundred married teachers among the 400 instructors in the school system.

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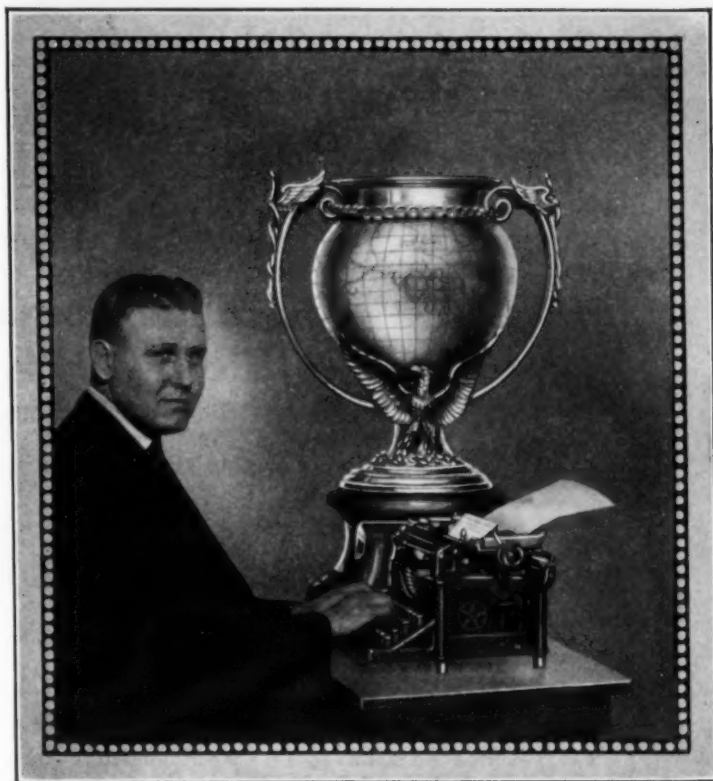
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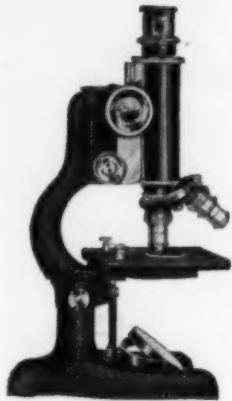


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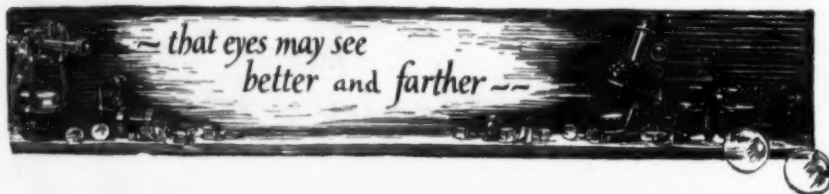
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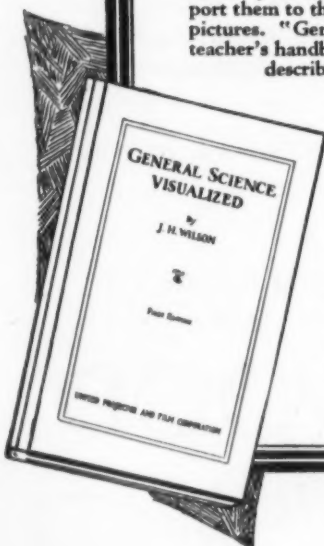
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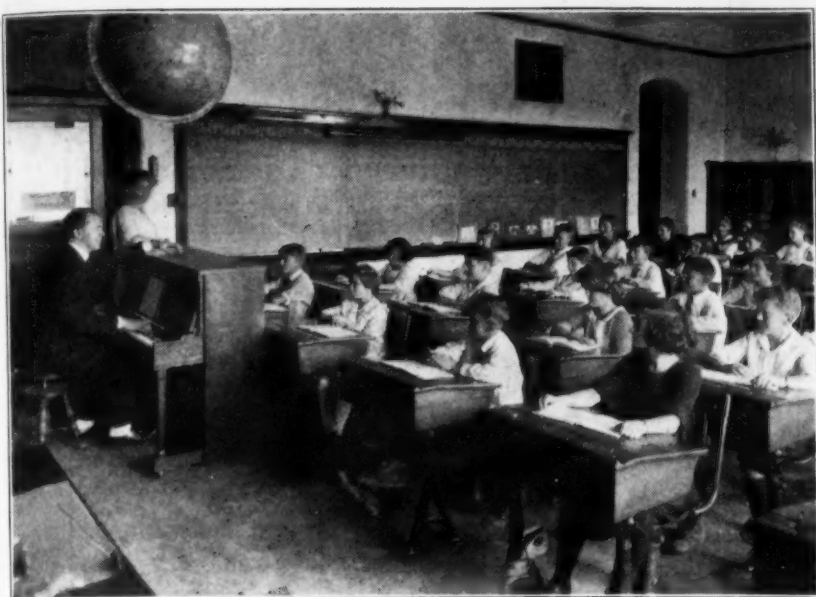
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NEW BOOKS

Fundamentals of Practical Mathematics.

By George Wentworth, David Eugene Smith and Herbert Druery Harper. Cloth, 202 pages, illustrated. Ginn & Co., Boston, New York, Chicago.

As the first volume of a new series of mathematics texts this book is a radical departure in method, content, and even mechanical standards, from the conventional textbook. The authors have assumed that the classes which will use the book will later enter some trade or occupation in which a broad, solid foundation of the fundamental operations and principles of arithmetic, geometry and trigonometry are essential. They take it for granted that the boys have had an ordinary arithmetic course and consequently begin the work with an intensive review, emphasizing each principle with typical industrial and trade examples. The new work includes chapters on (a) ratio and proportion, with applications to mechanical devices and drawing; (b) mensuration, including the common industrial uses, geometric constructions, roots, and the metric system; (c) trigonometry and the use of functions; (d) the slide rule, and (e) general applications with a wide variety of problems. While the teacher of theoretical mathematics is constantly disturbed at the lack of mathematically formal definitions, the absence of the traditional proofs and the extreme brevity of explanations, he cannot dodge the fact that the work is amply clear, exceedingly practical and interesting, and fully complete for the purpose. The student who masters the book has a hand skill in the use of a complete set of the common mathematical tools which the mechanic and engineer and draftsman in whatever field must have.

The illustrations are in the shape of "blue-prints" and enliven the book as well as illustrate the problems.

The Pedagogy of Physical Training.

By C. Ward Crampton. Cloth, 257 pages, illustrated. The Macmillan Co., New York, N. Y.

This useful book is limited to the pedagogy of formal physical training courses in elementary and secondary schools. While we disagree with the author in some of his psychological dicta, the statements of lesson plans, class organization, corrective work, recreational work, educational work, appeal to us as sound and safe.

Jack and the Bean-stalk.

Jack the Giant-Killer.

By Reginald Wright Kauffman. Each, 50 cents. Illustrated. Cloth, 62 pages. Henry Altemus Co., Philadelphia, Pa.

Two old favorites are reproduced in flowing verse, with colored illustrations.

Peter Rabbit and Jack-the-Jumper.

By Linda Stevens Almond. Cloth, 62 pages, illustrated. Price 50 cents. Henry Altemus Co., Philadelphia, Pa.

The adventures of two rabbits cleverly told and well illustrated.

Measuring Textbooks.

Frank E. Spaulding. Paper, 40 pages, with measuring scales. Newson & Co., New York, Chicago.

This book outlines a method and provides a definite scale for measuring primary method readers, basal literary readers, language books, and spellers. In each case he defines the objectives of teaching, the qualities necessary to adapt the book to the pupils' needs, the qualities essential for the teacher's use and the physical or mechanical excellences. The several elements are rated according to their importance to total a thousand points.

Whether we agree with the distinguished author's statement of objectives and his distribution of values, it must be said that the book and scales are definite, easily understood and readily applied to any textbook and constitute a workable scale. The measures for language books and spellers appeal to us as especially adequate and helpful.

Modern Physiology—Hygiene and Health.

By Mary S. Haviland. Good Neighbors—Second Book. Cloth, 366 pages, illustrated. J. B. Lippincott Co., Philadelphia, Pa.

This book surprises one by beginning with a portrait of Abraham Lincoln. The use of the portrait of the martyred President finds its justification in that the book aims to serve those employed in factories and on farms, in offices and in domestic service, in order to improve the physical welfare of the worker and citizen of the future. Lincoln is titled a worker and a citizen.

It centers its efforts upon correct carriage, attitudes and movements of the human body in ordinary play and work operations. The choice of food, care of skin, eyes, ears and hair, the matter of breathing, clothing, etc., etc., all are dealt with in a practical way.

English Study and English Writing.

By Henry Adelbert White. Cloth, 336 pages. D. C. Heath and Company, Boston, New York, Chicago.

The list of books on English is an endless one. The justification for the preparation of the present volume is that it meets a specific use. The author has long been interested in teaching high school English, and has provided a textbook that is intended for those who have had a year's training in such elementary work, as is usually given with the first months of a high school course.

It treats the fundamentals of grammar and rhetoric and provides instruction in advanced letter writing. Oral expression is also dealt with. More than half of the book is given to the study of forms in literature. While we do not agree with all the readings suggested by the author the text impresses us as a decided step in advance of the conventional book for high school use.

Teachers' Manual—First Reader.

By Eulalie Osgood Grover. Cloth, 188 pages, The Macmillan Co., New York, N. Y.

This manual is to accompany the author's Everyday Classics First Reader. It is very complete and detailed in its suggestions for word study, oral reading, seat study and phonics and seems to be directed rather to the inexperienced teacher.

The Sunbonnet Babies in Italy.

By Eulalie Osgood Grover. Cloth, 188 pages, illustrated. Price 85 cents. Rand McNally & Co., Chicago, New York.



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The Fortunate Days.

By Ethel May Gate. 128 pages, cloth bound. Published by Silver, Burdett & Company, Boston and New York.

This volume contains a fairy tale in which Hassan, a Constantinople tailor, is the hero. It is followed by three other tales, "The Golden Horeshoe," "The Castle of Delight," and "The Story of the Learned Man." All are well told and illustrated with shadow pictures.

The book is well adapted for juvenile reading and is bound to fascinate the child mind.

The Broom Fairies.

By Ethel M. Gate. 110 pages, cloth bound. Published by Silver, Burdett & Company, Boston and New York.

Here is a delightful collection of tales dealing with the fairyland. They tell of "A Frozen Princess," "Queen Mab's Horns," "Little and Good," "The Eight Roads," etc., etc.

"Once upon a time" will excite a child's expectation and if the tale that follows is well conceived and well told, the author can infuse touches of play, of discipline and of order that sink into the lives of the little ones. This has been the aim of the author, and she has succeeded admirably well.

Intelligence Tests and School Reorganization.

By Lewis H. Terman, Virgil E. Dickson, A. H. Sutherland, Raymond H. Franzen, C. R. Tupper and Grace Fernald. Paper, 111 pages. Price 96 cents. World Book Co., Yonkers-on-Hudson, N. Y.

This pamphlet is significant in that it suggests the fundamental need of intelligence tests

and of grouping children on the basis of findings and shows the range of the work from city wide efforts to individual treatment of specific special cases. The papers are interesting also as interpretative accounts of significant experiments which point to present tendencies and which serve as worthwhile models for work in communities which cannot afford to employ expensive experts.

Labor Problems and Labor Legislation.

John B. Andrews. Cloth, octavo, 138 pages. Published by American Association for Labor Legislation, New York.

In brief space this book presents a comprehensive survey of present-day labor conditions and a series of recommendations for legislation in such matters as wages, hours, safety, health, self-government of workers, and social insurance. The book is sane, practical and clear cut. It is frankly a presentation of the subject from the workers standpoint only and where it fails in justice, the fault is due to excess of zeal for the welfare of the mass of workers. Some of the proposals for health and old age insurance and some of the observations on strikes appear visionary in the light of their constitutional aspects. What a wonderfully efficient document a book of this kind would be if it based its message on a broad foundation of the two divine injunctions to love one's neighbor as oneself and to do unto another as one would have done to oneself.

Self-Help English Lessons.

By Julia Helen Wohlfarth and John J. Mahoney. Third Book. Cloth, 392 pages, illustrated. World Book Co., Yonkers, N. Y.

This text affords a complete course in language and grammar for the seventh and eighth grades. Developed along the project method and suggesting material for self-help in individual study, it is as nearly self-teaching as a text may become. Particularly satisfactory are the emphasis on oral composition, the frequency of habit forming drills, and the insistence on ear testing exercises and lessons in appreciation. Grammar as such is rather informally taught but is quite ample and attractive. We should be inclined to disagree with the lists of books recommended for summer reading as heavy and indusive of several unsuitable books.

Music Primer.

Lauretta V. Sweesy and Josephine Howard. Cloth, 84 pages. Price, 72 cents. Ginn & Company, Boston.

This text is intended for use in classes of beginners in sight singing. The melodies are of the simplest, beginning with stepwise and repeated tones, advancing to two-tone intervals and finally to two tones to the beat. The words are charming little verses of child interest. The book is well illustrated.

Poe's Poems.

Cloth, 8 vo. 311 pages. Price, \$1.75 net. Thos. Y. Crowell & Co., New York.

A complete edition fully annotated. This book is suited for the advanced student of literature who desires to make an intensive study of Poe's melancholy verse. For school use a much less complete edition would seem better suited.

PUBLICATIONS.

Rules and Regulations Concerning State Teachers' Certificates for Connecticut, 1922. The pamphlet gives the terms and definitions, kinds of certificates, and rules governing certificates, together with an appendix.

Equipment and Rooms for Home Economics Departments. Home Economics Circular No. 11, January, 1922. Issued by the Bureau of Education, Washington, D. C. The type of rooms assigned for the use of home economics departments and the location of these rooms in the school building largely determine the kind and quality of the instruction given. The pamphlet gives the space requirements for home economics, equipment for home economics rooms, standard cooking equipment with group arrangement, general type of cooking desks, types of tops for cooking desks, location of desks, sinks and stoves, and offers suggestive plans for the arrangement of equipment.

Standards of Equipment and Maintenance for State Rural Schools and State Consolidated Schools for South Dakota. Issued by the State Department of Public Instruction, Pierre. The booklet has been published to acquaint school boards of rural districts with the minimum requirements of the law relative to rural school standards, and the additional standards which a rural school must reach in order to obtain state aid.

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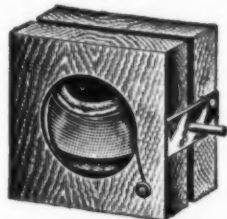
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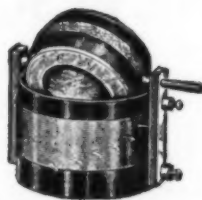
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SOME PHASES OF SCHOOL HEATING AND VENTILATION.

(Concluded from Page 40)

particularly true in large buildings having great glass area.

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catchers are provided, but are not very effective.

Since nearly all makes of unit heaters have but one radiator, the only method of temperature control is by dampers. As there are no separate tempering heaters, the tendency is for a hot air delivery or a cold air delivery, with abrupt changes between the two extremes. Automatic temperature regulation is necessary, therefore, and even with automatic temperature regulation functioning there is danger of drafts.

The unit heaters nearly all deliver the fresh air vertically, at the window side of the room, using the ceiling as a deflector or spreader. The distribution of fresh air from such a delivery point to the occupants is rather favorable.

The encasement of the radiator in a steel jacket which to a great extent prevents local over-heating of the people by radiation, is decidedly favorable.

The exterior appearance of a building having unit heaters, with its unsymmetrical windows or partly open inlet windows, is noticeable. The electric consumption is low, because the frictional resistance is light. Where other radiators than those in the ventilating cabinets are installed, the objection inherent to the split system is encountered, that the room may be heated sufficiently for occupancy without ventilating it.

When unit heaters are used without individual fireproof vent flues from each classroom, but with the corridors and stair halls made to serve as vent flues, there is danger, in case of fire, of the stairways becoming chimneys. This is prejudicial to the easy escape from the building of the pupils.

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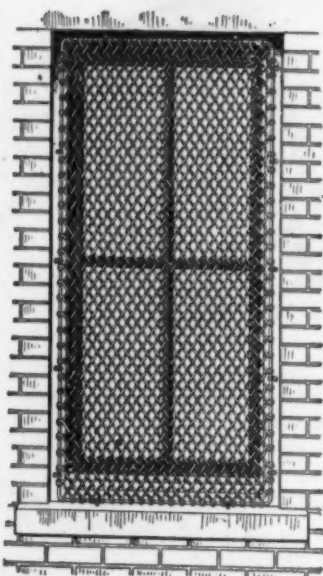
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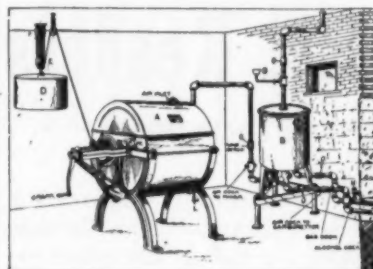


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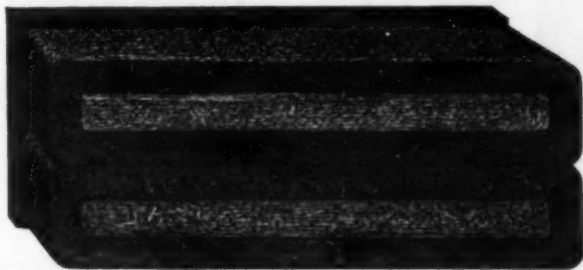


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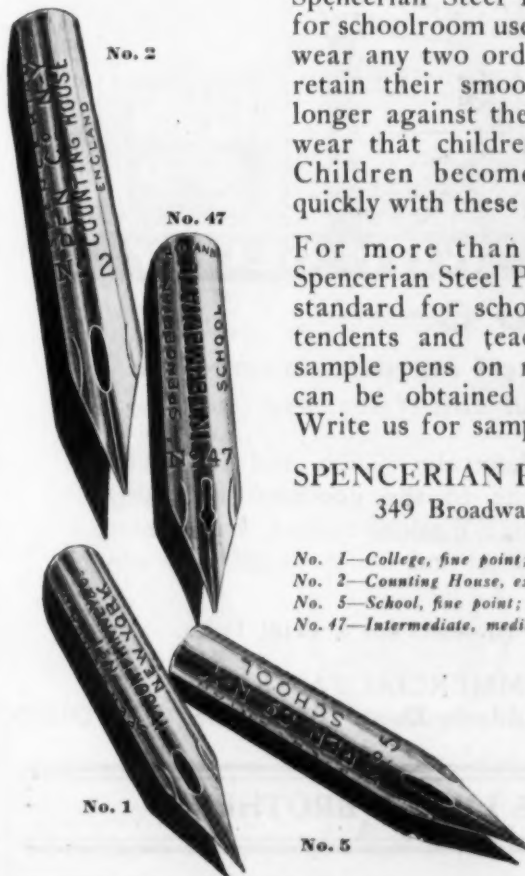
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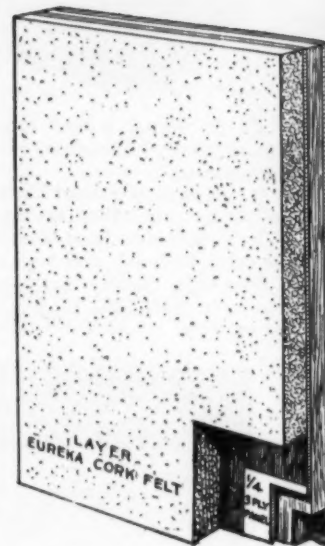
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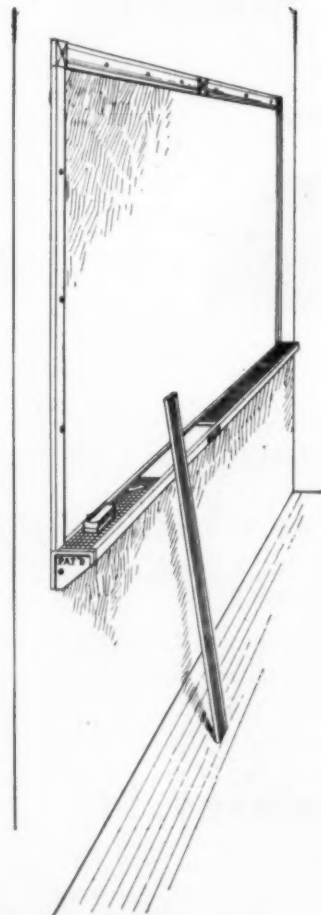
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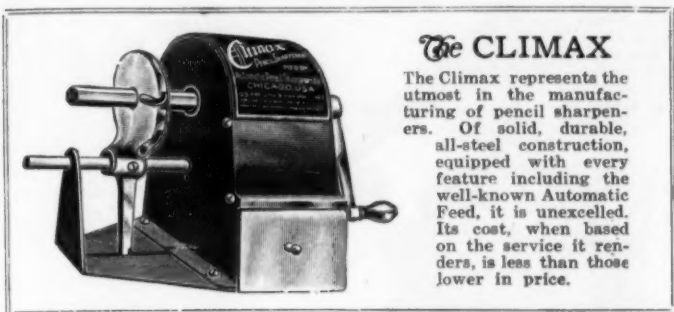
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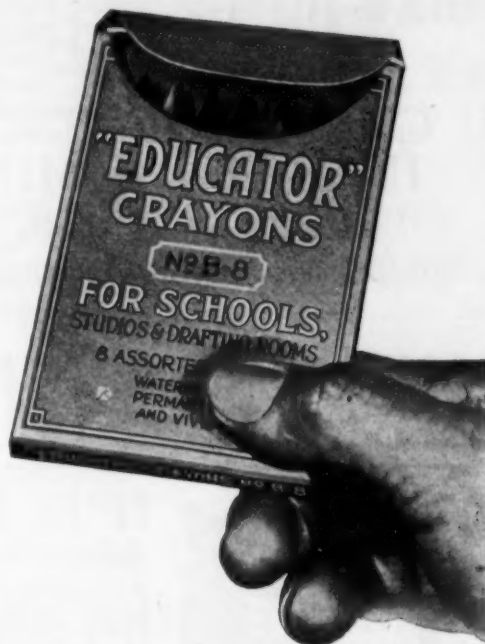
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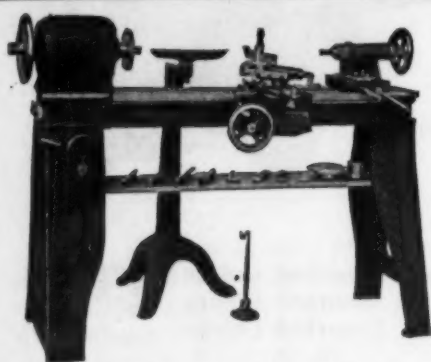
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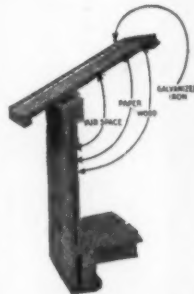
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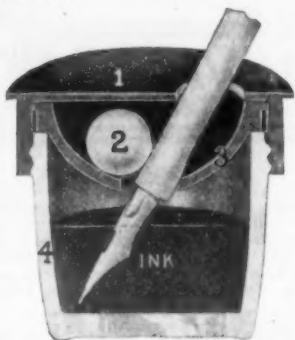
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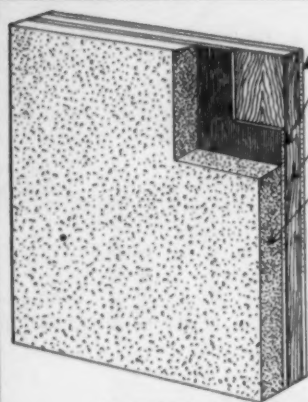
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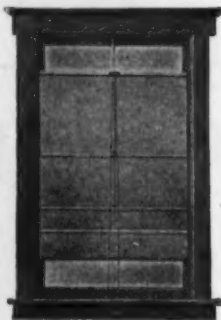
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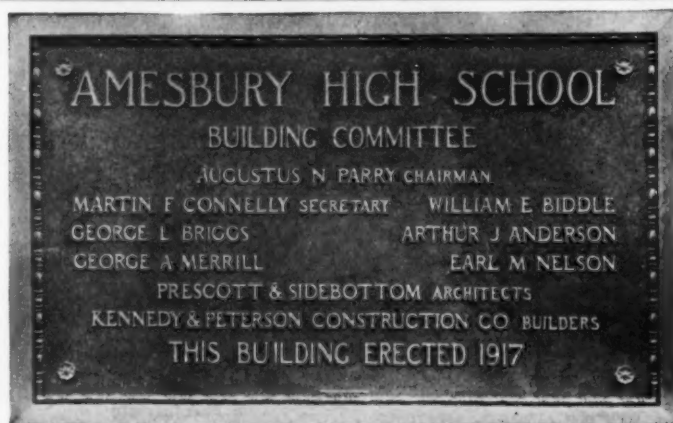
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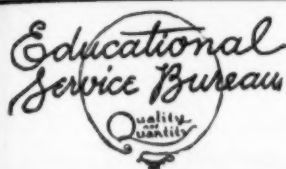
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MEMORIAL TABLETS

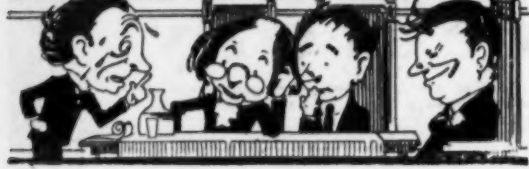
Russell & Sons Co., Albert

Williams, Inc., John

METAL LATH

Berger M

AFTER THE MEETING



The Honor System.

The Student—Say, Myrtle, this Honor System is sure some stunt. Yesterday the Prof. calls my rummate up to the desk an' says, "Look here, Mr. Dummer, what authority was you quoting? Almost every sentence in your paper is enclosed in quotation marks." An' Bill says back: "Between you an' me, Prof., I was quotin' the fellow next to me."—Yale Record.

The Newspaper Service.

A teacher the other day received some first-hand information on how the other half of the world lives. It was a school in the mill district and the class was struggling with its reading lesson. Little Ivan was progressing more or less successfully until he came to the word "plate." There he stumbled.

To help him, the schoolma'am inquired: "P-l-a-t-e, Ivan. What is it that mother brings in the bread on?"

Little Ivan's face lit up with a proud gleam of understanding. "A newspaper," he responded quickly.

Teacher was talking to her pupils about games.

She asked Jonny what games he played at home.

"High, Low, Jack, and the Game," he said.

So Anxious to Study!

The two college juniors stretched and yawned. "What shall we do tonight?" said one.

"I'll toss up a coin for it," his chum replied. "If it's heads we'll go to the movies; if it's tails we'll call on Nan and Bess; and if it stands on edge we'll study."—Ladies Home Journal.

Interested.

Grad—"This university certainly takes an interest in a fellow, doesn't it?"

Tad—"How's that?"

Grad—"Well, I read in the graduate magazine that they will be very glad to hear of the death of any of their alumni."—Siren.

Forestalled.

"Now what shall we name the baby?" asked the professor's wife.

"Why," ejaculated the learned man in astonishment, "this species has been named for centuries. This is a primate mammal—'homo sapiens'."—The Forecast.

Correct.

Economics Professor—"Name some production in which the supply exceeds the demand."

Stude—"Trouble."—Northwestern Purple Parrot.

Home.

Professor Noalot was very absentminded. One morning he drifted into the barber's to be shaved. After the operation he continued to occupy the chair and the barber, thinking he had dozed off gently reminded him by saying: "Asleep, sir?"

The professor started, "Bless me, no!" he exclaimed. "I am not asleep, but I am terribly short-sighted. When I took my glasses off I was no longer able to see myself in the mirror opposite and naturally I supposed I had already gone home."—N. Y. Globe.

In the Abstract.

The professor was putting the finishing touches to his new concrete pathway. Tommy, aged six, had been watching the proceedings with great interest, and at length, deeming the time right for trial, started to cross before the mixture had time to dry.

When the professor displayed his annoyance a passer-by observed:

"Why, professor, I thought you liked children."

"I like them all right in the abstract," the professor replied, "but not in the concrete."—N. Y. Globe.

She: Do you think education is a failure in America?

He: No, but a good many who attempt it are.

Very Good, Very Good.

Teacher: Now tell me the name of the insect which is first a Tank and then an aeroplane.

Pupil: It's the caterpillar, which changes into a butterfly.—Illustration (Paris).

He Was Sympathetic.

"Now," thundered the school teacher on a

morning of unusual density on the part of his scholars, "you are all blockheads, but there must be one among you who excels in something even if only in crass ignorance. Let the biggest dunce in the school stand up."

The invitation was more in the nature of "bluff" than anything else; but, to the teacher's surprise, one stolid-visaged lad rose to his feet.

"Oh," purred the master, "I am glad to see that one of you has the honesty to admit his ignorance."

"Tisn't that, sir," said the youthful satirist; "but I hadn't the 'heart to see you standin' there by yourself!"—N. Y. Globe.



NEW TRADE PRODUCTS.

New Bausch & Lomb Lens Products. The Bausch & Lomb Optical Company, Rochester, N. Y., has just announced the perfecting of an Ultra Rapid Anastigmat Lens for photographic work. The lens is rated at F:2.7 and is twice as fast as an F:3.5 lens, which has been the fastest lens available in the past.

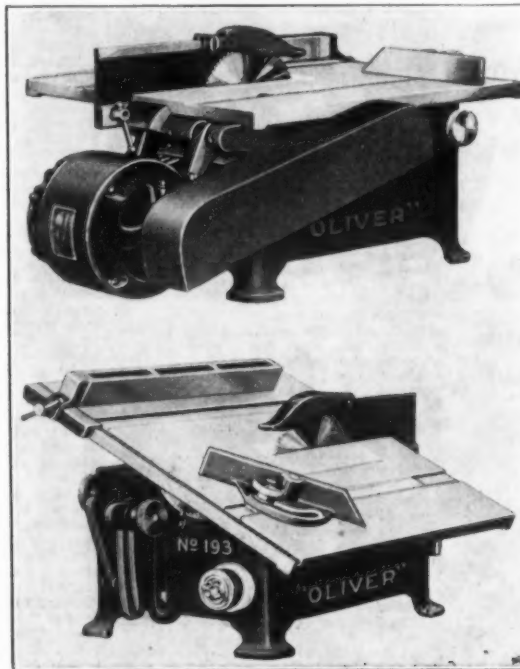
A second new product is the Home Balopticon, a high-grade opaque projector, for use at home and in small schools. The instrument is similar to the Bausch & Lomb combined Junior Balopticon, which is a popular lantern slide-projector and opaque projector, and is widely used in schools. Circulars are available.

School Savings Banking. An honor roll and report on school savings banking has been issued by the American Bankers' Association. It divides the various cities in classes according to enrollment. In class A, enumerating cities having an enrollment over 10,000. Louisville, Ky., heads the list with total collections for the year 1921 to 1922 of \$76,236.27 and average gross deposits of \$2.79.

In class B, cities having an enrollment of from 5,000 to 10,000 in the schools, Racine, Wis., is at the top with total collections of \$31,106.78 or an average of individual deposits of \$3.81. Class C, cities with enrollments of from 2,000 to 5,000 is headed by Morristown, N. J. Total collections, \$12,126.18. Average deposits \$4.82. Class D, which forms the longest list and which deals with cities having enrollments under 2,000. Jamaica Plains, Mass., is on top. The collections for the year were \$2,495.68. Average deposits \$2.04.

The report states that the school children have deposited five and one-half million dollars in their savings bank systems for the year 1921-22, an increase of 40 per cent over the previous year.

Remove Office. Silver Burdett & Company, publishers have removed their New York office to 41 Union Square, West with A. L. Hart in charge.



OLIVER No. 193—7 INCH MOTOR DRIVEN BENCH SAW.

RECENT TRADE PUBLICATIONS.

Acid-Proof Drain Pipe. The Duriron Company, Dayton, Ohio, has just issued a valuable hand book on Duriron Pipe and Pipe Fittings which is acid and alkali proof and which is especially manufactured for drainage from laboratories, workrooms, and other spaces where corrosive liquids are used. The Duriron line of materials includes sinks and sink outlets, traps, pipes, pipe fittings, dilution basins, and floor drains. The booklet not only illustrates and describes each article in the line but also contains architects' drawings and complete specifications for the benefit of builders, architects, contractors and engineers. The Duriron Company also manufactures the well-known Duriron exhaust fan for laboratories, pickling rooms and similar places where fumes and acids will corrode an ordinary fan and destroy an ordinary motor. The Duriron fans are made in four sizes and have been widely used in school and college laboratories. The booklet will be sent to any architect or school authority on request.

Flooring. The Marbleoid Co. has just issued a new, illustrated, 4-page circular describing its composition flooring as applied to schools. Marbleoid as used in the typical classroom, laboratories, cafeteria, corridors, stairways and auditoriums, is illustrated in color. The application of this flooring to wood construction, concrete construction, as a sanitary base and as stair treads and risers is very forcibly shown. Copies available from the Marbleoid Co., 461 Eighth avenue at Thirty-Fourth street, New York.

American Portable Schoolhouses. Under this title an attractive catalog has been issued by American Portable House Company of Seattle, Washington.

This catalog is illustrated with a series of portable one and two-room buildings. These are accompanied by floor plans which give ample evidence of knowledge of the builders as to modern conceptions in providing smaller buildings. The single room houses are provided with cloakrooms, while the two-room buildings are provided with both cloakrooms and teachers' rooms.

The text which accompanies these illustrations is instructive. The portables not only observe neatness in appearance, but also the essentials of light, ventilation and warmth.

Book Notes. The current issue of Educational progress a small periodical published by the Houghton, Mifflin Company of Boston is devoted to diagnostic progress scores in arithmetic. It contains an instructive monograph by Franklin S. Hoyt and Harriet E. Peet.

The Value of a High School Education. The Harter School Supply Co., of Cleveland, O., has issued a very interesting little booklet entitled "The Value of a High School Education." The pamphlet is being used by schools all over the country as a means of boosting high school attendance and has proved to be an effective piece of more and better education advertising, presenting the subject attractively to students and giving the parents a better appreciation of their schools. The pamphlet contains interesting statistics on illiteracy, on opportunities afforded as a result of high school training, on getting a fair start in life, on earning power of high school graduates, and on the money value of each day in high school.

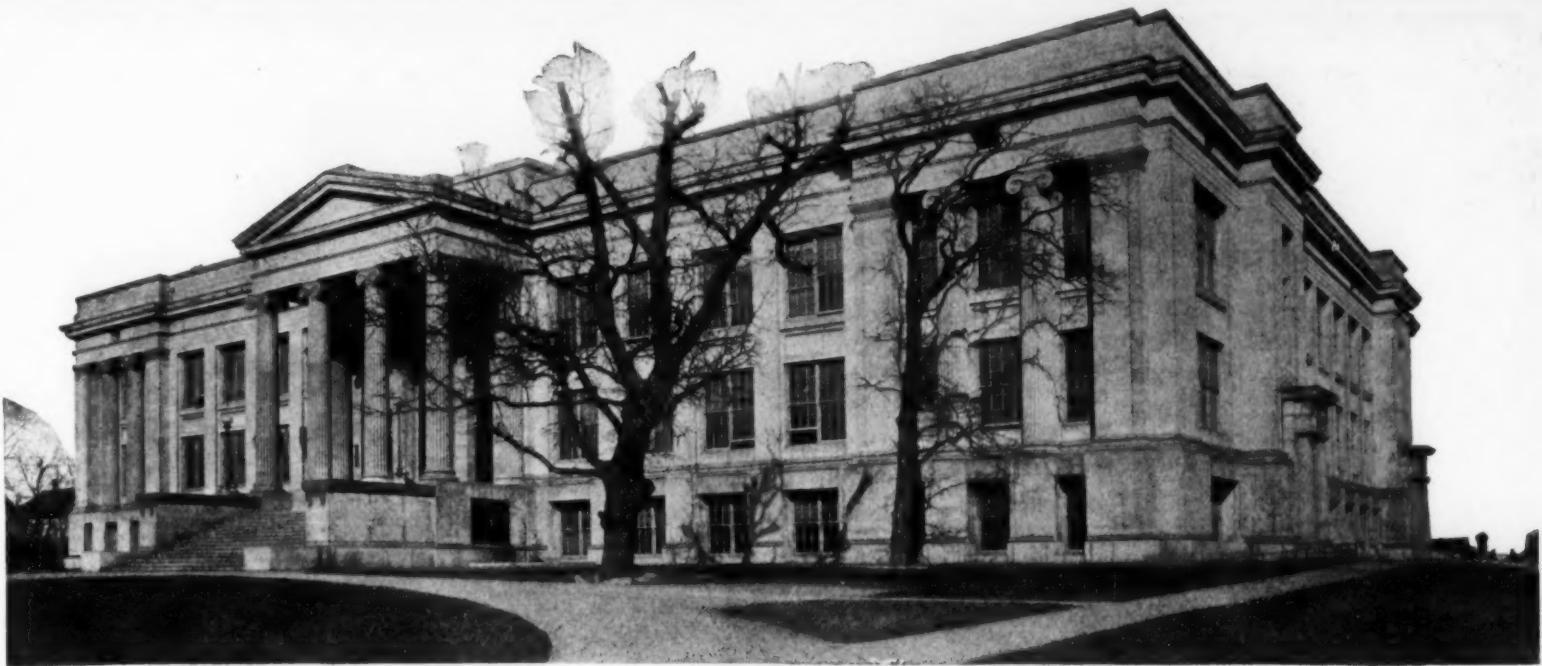
NEWS OF SCHOOL ARCHITECTS.

New Architectural Organization. Mr. John J. Donovan, architect, has announced that he has associated with himself Dr. Frank W. Hart, Associate Professor of Educational Administration and Mr. L. H. Peterson, associate in Educational Administration at the University of California for providing an improved consulting service to school boards and architects. Mr. Donovan is well known as a specialist in schoolhouse planning and construction and Dr. Hart and Mr. Peterson have specialized in this same subject from the standpoint of professional school administration.

The services of the new organization will be available for the preparation of schoolhousing programs, for school building surveys, for the planning and construction of individual school buildings, and for general consulting service to school boards and architects.

Dissolve Partnership. The architectural firm of Capelle & Troutman have dissolved partnership and Mr. Troutman continues business as usual in the same office suite at 409 American Trust Building, Evansville, Ind., under the name of Charles L. Troutman, architect and engineer.

Mr. Troutman is the supervising architect of the Benjamin Bosse High School, the plans for which were made by the Joseph C. Llewellyn Company, of Chicago.



East High School, Des Moines, Iowa. Proudfoot, Bird & Rawson, Architects

Indiana Limestone School Buildings Are True Civic Assets

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Within 24 to 36 hours after installation the composition material has set into a tough, elastic, floor which offers attractiveness, warmth, sanitation, absolute fire-resistance, and freedom from repair and upkeep expense other than the usual cleaning. While it is a *permanent floor* and possesses great strength,

it is at the same time resilient to the tread and desks can be attached with expansion bolts or with screws as shown by photograph above.

The Architect or School Board using Marbleloid flooring is taking no risk. The material is manufactured and installed by an organization possessing an experience with school floors extending over the last 18 years and which is so certain of its flooring and installation that it gives an unrestricted guarantee on each.

Investigate the suitability of Marbleloid Flooring for resurfacing old floors or for new installations; for Classrooms, Entrance Halls, Kindergartens, Cafeterias, Corridors, Auditoriums, Dormitories and other school rooms.

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Snowden Ashford, Architect

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